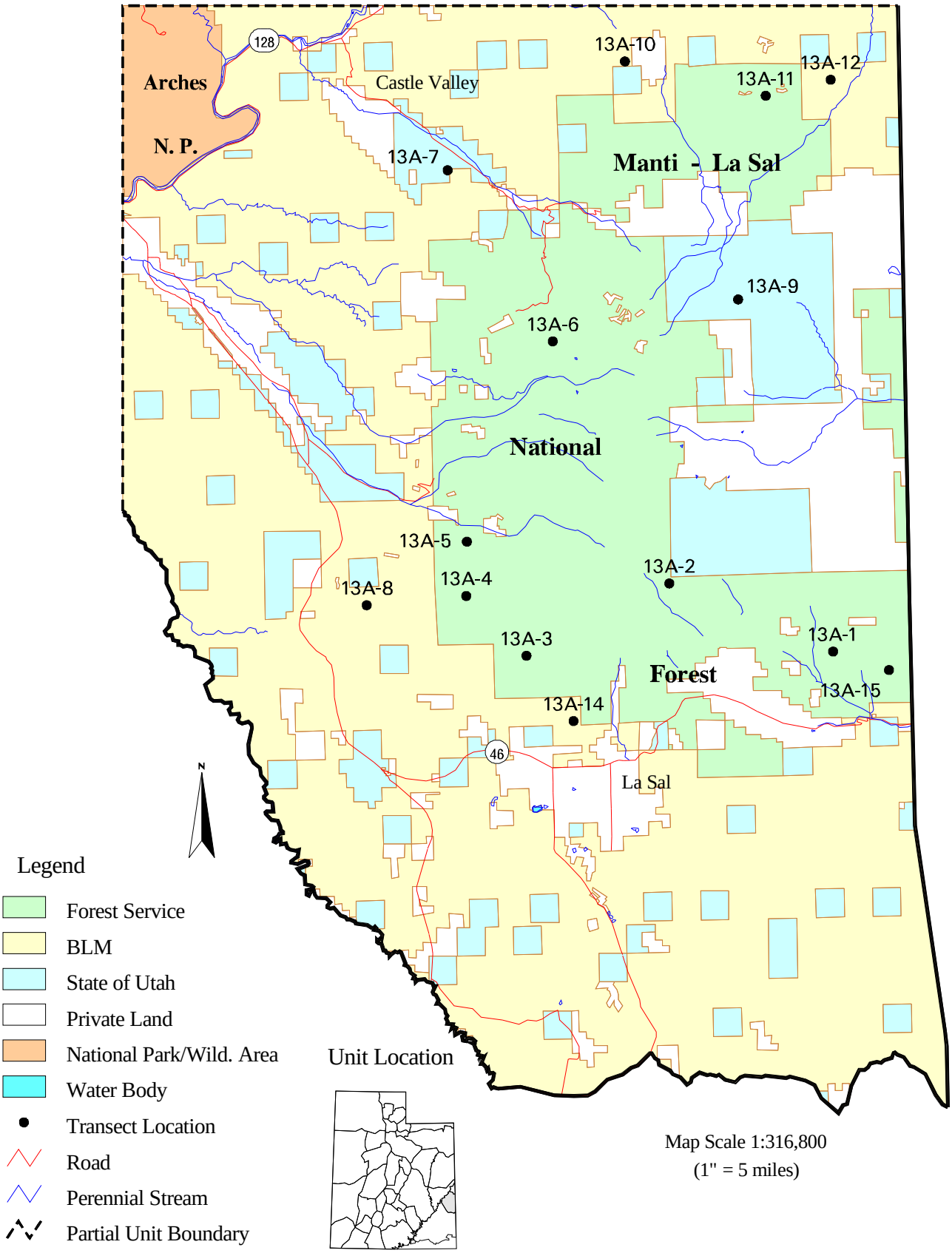
Management Unit 13a



WILDLIFE MANAGEMENT UNIT 13A (33, 30A) - LASAL MOUNTAINS

Boundary Description

Grand and San Juan Counties - Boundary begins at the junction of Interstate 70 and the Green River; then south on the Green River to the Colorado River; then north on the Colorado River to Highway SR-191; south on SR-191 to the Big Indian road; east on this road to the Lisbon Valley road; east on this road to the Island Mesa road; east on this road to the Colorado state line; north on the state line to the Dolores River; northwest on this river to the Colorado River; northeast on this river to the Colorado state line; north on this line to I-70; west on I-70 to the Green River and beginning point.

Winter Range Description

The boundaries of this unit encompass a very large and varied area. The predominant vegetation in the northern part and along the western portion of the unit is a desert shrub type which receives little use by deer or elk. This lower country is inhabited mostly by desert bighorn and antelope. The deer and elk range is centered on and around the LaSal Mountains. From the bare talus peaks at 12,700 feet, the mountain levels off to a 8,000 foot plateau, then slopes gently down to the desert below at about 4,000 feet. Deer generally winter on the mesas at 8,000 feet or lower. North-facing slopes in steep canyons and the lower desert areas also provide some additional wintering areas. The 1967 range inventory (Coles and Pederson 1968) identified 450,240 acres of deer winter range, making up approximately 46% of the unit. Much of the winter range is within the pinyon-juniper type, where many range rehabilitation projects have been completed through the years. The desert shrub type, which comprises about 25% of the winter range, is used mostly during severe winters.

BLM administered land comprises 59% of the winter range on this herd unit. The Forest Service manages the higher mesas, which represent 19% of the winter range. State ownership is also substantial. The major use of the federal and state land is livestock grazing. There is currently limited activities pertaining to mining, oil, and gas drilling. Recreation and tourism is a major influence on the area, but most of this activity is concentrated in the lower desert areas, along the Colorado River and in National Parks. On private land around Moab, Castle Valley, Fisher Valley, and LaSal, there are farming and ranching operations.

Key Areas

Generally agreed upon key big game areas are: the Fisher Valley - Fisher Mesa area (USFS and BLM, approximately 2,900 acres), lower Castle Valley severe winter range (BLM and state, 3,800 acres), Upper Castle Valley and Porcupine Draw (USFS, 1,280 acres), Bromley Ridge (USFS, 1,000 acres), Black Ridge (BLM, 1,400 acres), Pole Canyon - Slaughter Flats - Buck Hollow (USFS, 9,500 acres) and North Beaver Mesa (USFS and BLM, 600 acres). In a published Manti-LaSal Forest Management Plan, these areas are identified as general big game winter range. No key winter range was identified on the Moab District.

The majority of the key areas identified are managed by the BLM or USFS. The Forest Service has range studies over all the key areas. Ecological site data (SVIM) is available for the studies on BLM administered land. All of the key areas studied are also grazed by domestic livestock. The BLM areas are generally grazed by cattle in spring (May - June). Fisher Valley also has fall and winter cattle use. North Beaver Mesa is grazed November to May 31. The Forest Service land on upper North Beaver Mesa is grazed by cows May 1 to June 15 and October 16 to November 25. The Forest Service allotments are under a rest/deferred rotation grazing system. Use generally occurs from June to mid-October.

Herd Unit Management Objectives

The targeted winter herd size is to have a herd population of 13,000 deer on the LaSal mountains. The major management problems on the unit are related to low deer numbers and a slow response in total numbers of

deer to restricted harvest. However, this should be expected with the fawns/100 does ratio decreasing over the years and continuing to decrease over the last five years (1990-1995) to 48 (Evans et al. 1995). The average is still low at only 50 fawns/100 does through 1999.

Much of the winter range around the LaSal Mountains has had some kind of treatment to provide improved grazing and winter range conditions. The treatments are mainly pinyon-juniper chaining and seeding projects, roller-chopper treatments of old chainings, sagebrush removal, and contour trenching on the more eroded sites. A majority of the range trend studies established on the unit sample these treated types. Chained areas are found on North Beaver Mesa, Black Ridge, Amasas Back, Slaughter Flat, Buck Hollow, and the Two-Mile Chaining. Due to the wide difference in treatment years, from 1960 to the late 1970's, early 1980's, and early 1990's, there is considerable variability to what stage of succession they are in. Basically, on the areas studied except for Amasas Back, pinyon-juniper encroachment is not yet a problem. The key browse species is mountain or Wyoming big sagebrush which dominate most sites. The higher elevation treatments on North Beaver Mesa, Buck Hollow, and Two-Mile Chaining also have a variety of other browse and abundant quantities of grass. Treatments on critical deer winter range on Slaughter Flat, Upper Fisher Valley, and Black Ridge have a moderately dense stand of Wyoming big sagebrush (averaging 3,633 plants/acre) with an understory of crested wheatgrass. These sites are limited in their ability to produce other desirable browse.

The primary management objective of the DWR, BLM, and the Forest Service is to maintain the value of the chained areas for big game and livestock. Thinning existing regrowth and promoting the establishment and production of desirable browse and herbaceous species will result in long-term benefits for big game.

Study Establishment

Locations for herd unit 13A trend studies were determined in an Interagency meeting in Moab in 1986. However, they could not be incorporated into the range crew schedule until the summer of 1987. The studies were then established and read during June of 1987. Three studies were set up on big game summer range. Another three were established on transitional deer and elk ranges. The remaining seven studies sampled lower elevation critical deer winter range around the base of the mountain. Meetings again with Interagency personnel in the summer of 1994 determined that an additional two sites would need to be added because of the increases in the elk population. These studies are #14, Lower Lacky Fan, and #15, Hideout Mesa.

Trend Study 13A-1-99

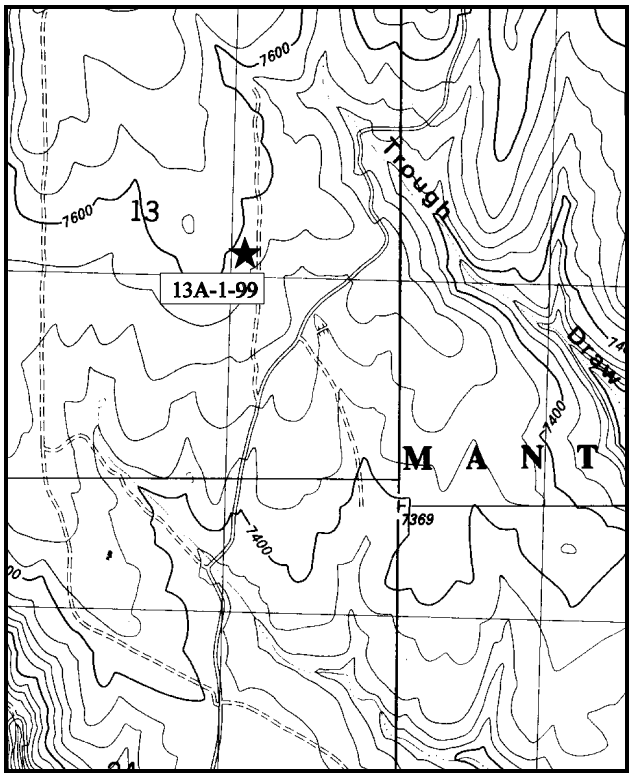
Study site name: Two Mile Chaining . Range type: Chained, Cabled, Seeded P-J .

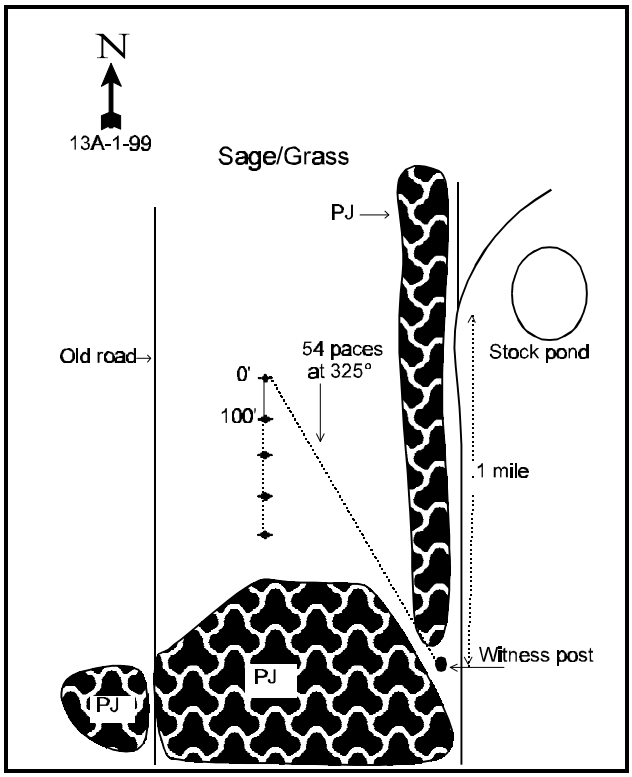
Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Travel east on SR 46 through the town of LaSal to mile marker 16. Continue 0.1 miles, then turn left off the highway. Proceed 1.2 miles to a fork. Turn right and proceed toward Buckeye Reservoir for 0.8 miles to another fork. Stay left and continue 2.95 miles to a witness post (fencepost) on the left side of the road. The transect is located in the chaining opposite a fork further up the road and can be reached from the witness post by walking 54 paces northwest (325°). The 0-foot baseline stake is a l-foot tall fencepost, tagged #7813.





Map Name: Ray Mesa Diagrammatic Sketch

Township 28S , Range 25E , Section 13 UTM 4247895.620 N, 665143.632 E

DISCUSSION

Trend Study No.13A -1 (33-1)

This study is located in the Two Mile Chaining on the south end of the LaSal Mountains. Nine hundred acres were chained and seeded in 1978. This Forest Service chaining is thought to be important as spring/fall transition big game range and is becoming increasingly important as elk winter range. During the 1994 surveys, elk pellet groups occurred twice that of deer. The data from 1999 continues to show this same trend with 32 deer days use/acre (79 ddu/ha) and 70 elk days use/acre (173 edu/ha). The allotment also receives summer/fall cattle use. The site is dominated by mountain big sagebrush and many other useful browse species. Grasses, especially seeded species, are an important vegetative component on the site.

The study site is characterized by long, gently sloping foothills, generally with a southeast aspect and an elevation of 7,650 feet. Slope of study area is a gentle 4%. The soil is a loam with a slightly acidic pH (6.5) and an effective rooting depth of 11 inches. Phosphorus could be a limiting factor on this site with only 8ppm, as at least 10ppm is necessary for normal plant development. Organic matter appears to be well below average (2%). The sites in this herd unit average 3.5% organic matter. Erosion potential is low to moderate.

Mountain big sagebrush is the dominant browse species on the site. It made up 60% of the total browse cover in 1994, however it currently only makes up 39%. Low rabbitbrush is more than twice as abundant as the sagebrush, but only contributes 13% (1994) and 21% (1999) of the total browse cover. The moderately dense sagebrush population is composed mainly of light to moderately hedged mature plants. The proportion of the plants that are moderately hedged has increased from 13% (1994) to where it is currently at 41%. The biotic potential (proportion of seedlings to population) was quite high in 1994 (16%), and is still fairly good at 8% in 1999. In 1987, there were no seedlings sampled. The proportion of decadent plants in the population had risen from 13% (1987) to 42% in 1994. However, it has currently gone down to 24%. These changes in percent decadency are not necessarily the result of utilization, because no more than 3% the population in any year, has shown heavy use. The extended drought the state has experienced since 1985, is considered the major cause of this downward trend. Other desirable browse species are less common on the site. These species would include bitterbrush, serviceberry, snowberry, and mountain mahogany which are more common near the edge of the chaining. Scattered oak clumps are vigorous and show light to moderate hedging.

Herbaceous species diversity is high and plants are vigorous. Seeded grasses are well established and productive. Overall, crested wheatgrass was the most abundant seeded species, making up 21% of the grass cover in 1994. It has currently gone down to 18% of the total grass cover. Bulbous bluegrass, intermediate wheatgrass, and smooth brome are also important cover species. Silvery lupine was the dominant forb in 1994 (67% of the forb cover). It currently only makes up 3% of the forb cover. Some individual plants have been damaged by insects. Other forbs provide some green forage in the spring. The number of forb species have fluctuated over the years from 16 (1987), 12 (1994), and 16 (1999).

Overall, protective ground cover is good, although patches of bare soil account for 30% of the soil surface. Rock and pavement does not contribute very much to the ground cover on this site (<0.1%). Percent litter cover has decreased steadily since 1987, although this has occurred on all sites because of the extended drought for most years since 1985.

1994 TREND ASSESSMENT

The trend for soils would be slightly down because of the increase in the amount of bare soil (now 32%) and the decrease in percent litter cover (from 61% to 46%). However, there does not appear to be a problem with soil erosion because of the high amounts of grass cover and fairly level terrain. Trend for the key browse species is stable to slightly down. Mountain big sagebrush makes up 61% of the browse cover with a population of 4,800 plants/acre, but the trend for decadency should be watched closely to see if this trend

continues because there is a ratio of 1:40 (one dead plant to every 40 live plants). As the rate of percent decadency increases, there are going to be more dead plants in the population. With the low percentage of plants that are being heavily browsed (only 1%), this increased decadency has most likely been caused by the extended drought and associated winter injury. The trend for the herbaceous understory is easier to interpret as the nested frequency values for both the grasses and forbs have significantly decreased since 1987. Again, this has basically been caused by the prolonged drought.

TREND ASSESSMENT
soil - down slightly
browse - stable to slightly down
herbaceous understory - down

1999 TREND ASSESSMENT

The trend for soils is actually slightly up at this time with decreases in percent bare soil and the ratio of protective cover vs bare soil has improved from 2.8 to 3.3. Soil erosion still does not appear to be a problem because of the relatively large amounts of protective cover and gentle terrain. Trend for the key browse species is slightly down even with the improvement in percent decadence from 42% to 24%. Mountain big sagebrush made up 61% of the browse cover in 1994, now it only makes up 39% of the cover. It has also experienced a loss in numbers since 1994 (4,800 plants/acre), currently down to 4,080 plants/acre. The ratio of dead to live plants has also increased from 1:40 (2%) to now where it is 1:15 (6%). All this has taken place with only light to moderate use. The many years of drought have had a profound effect on sagebrush populations, along with competition with winter annuals. On this site, bulbous bluegrass now makes up 50% of the total herbaceous cover. The trend for the herbaceous understory is up with notable increases in sum of nested frequency for the grasses which make up almost 90% of the herbaceous cover.

TREND ASSESSMENT
soil - slightly improved
browse - slightly down for the key browse, mountain big sagebrush
herbaceous understory - slightly up

HERBACEOUS TRENDS --
Herd unit 13A, Study no: 1

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
G	Agropyron cristatum	135	106	100	55	39	40	2.46	2.50
G	Agropyron intermedium	-	-	3	-	-	1	-	.03
G	Bouteloua gracilis	15	19	17	5	6	8	1.07	.14
G	Bromus inermis	75	67	63	31	27	26	.63	2.40
G	Bromus tectorum (a)	-	-	3	-	-	1	-	.00
G	Carex spp.	-	-	-	-	-	-	.00	-
G	Koeleria cristata	$_{b}$61	$_{a}$3	$_{a}$19	23	1	8	.03	.18
G	Oryzopsis hymenoides	-	3	3	-	1	1	.00	.00
G	Poa bulbosa	$_{a}$220	$_{b}$256	$_{b}$250	81	85	82	7.14	8.01
G	Poa fendleriana	$_{a}$-	$_{b}$16	$_{c}$53	-	7	21	.06	.38
G	Sitanion hystrix	$_{b}$6	$_{ab}$1	$_{a}$-	3	1	-	.00	-
G	Stipa comata	$_{b}$48	$_{a}$14	$_{ab}$24	21	7	10	.11	.23

Type	Species	Nested Frequency '87	Nested Frequency '94	Nested Frequency '99	Quadrat Frequency '87	Quadrat Frequency '94	Quadrat Frequency '99	Average Cover % '94	Average Cover % '99
Total for Annual Grasses		0	0	3	0	0	1	0	0.00
Total for Perennial Grasses		560	485	532	219	174	197	11.52	13.89
Total for Grasses		560	485	535	219	174	198	11.52	13.90
F	Astragalus convallarius	$_{b}$40	$_{a}$17	$_{ab}$25	22	11	14	.10	.42
F	Castilleja chromosa	$_{c}$38	$_{b}$4	$_{a}$-	18	3	-	.01	-
F	Castilleja linariaefolia	-	2	1	-	2	1	.01	.03
F	Calochortus nuttallii	$_{b}$8	$_{a}$-	$_{a}$-	3	-	-	-	-
F	Crepis acuminata	$_{b}$14	$_{a}$6	$_{a}$-	7	2	-	.03	-
F	Erigeron flagellaris	-	-	3	-	-	1	-	.15
F	Erigeron pumilus	$_{b}$111	$_{a}$21	$_{a}$43	42	10	17	.07	.51
F	Eriogonum racemosum	$_{b}$63	$_{a}$30	$_{a}$34	27	13	15	.14	.30
F	Hymenoxys acaulis	3	-	3	1	-	1	-	.00
F	Lomatium triternatum	$_{b}$31	$_{a}$-	$_{a}$-	13	-	-	-	-
F	Lupinus argenteus	$_{c}$162	$_{b}$57	$_{a}$20	64	24	9	3.64	.14
F	Machaeranthera canescens	1	-	2	1	-	2	-	.01
F	Penstemon caespitosus	$_{b}$23	$_{a}$-	$_{a}$-	11	-	-	-	-
F	Penstemon spp.	$_{b}$62	$_{a}$2	$_{a}$6	29	2	2	.01	.03
F	Petradoria pumila	$_{a}$-	$_{a}$-	$_{b}$5	-	-	3	-	.06
F	Phlox longifolia	$_{b}$67	$_{ab}$53	$_{a}$31	30	23	13	.14	.06
F	Senecio multilobatus	-	1	1	-	1	1	.00	.00
F	Sphaeralcea coccinea	58	55	52	27	29	24	1.24	.38
F	Tragopogon dubius	6	-	-	2	-	-	-	-
F	Trifolium gymnocarpon	-	3	3	-	1	1	.00	.00
F	Unknown forb-perennial	$_{b}$6	$_{a}$-	$_{a}$-	3	-	-	-	-
F	Zigadenus paniculatus	-	-	3	-	-	1	-	.00
Total for Annual Forbs		0	0	0	0	0	0	0	0
Total for Perennial Forbs		693	251	232	300	121	105	5.43	2.15
Total for Forbs		693	251	232	300	121	105	5.43	2.15

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 13A, Study no: 1

Type	Species	Strip Frequency '94	Strip Frequency '99	Average Cover % '94	Average Cover % '99
B	Amelanchier utahensis	18	18	2.25	3.74
B	Artemisia tridentata vaseyana	86	82	16.28	9.40
B	Chrysothamnus depressus	12	26	.66	.72
B	Chrysothamnus viscidiflorus viscidiflorus	86	80	3.62	4.96
B	Cowania mexicana stansburiana	0	1	-	-
B	Coleogyne ramosissima	0	0	-	-
B	Coryphantha vivipara arizonica	0	2	-	-
B	Eriogonum microthecum	10	16	.01	.53
B	Gutierrezia sarothrae	0	4	.01	.04
B	Opuntia spp.	36	35	.32	.56
B	Pinus edulis	0	16	2.92	3.53
B	Purshia tridentata	0	1	-	-
B	Quercus gambelii	0	3	.76	.63
B	Symphoricarpos oreophilus	3	2	-	-
Total for Browse		251	286	26.86	24.13

CANOPY COVER --
Herd unit 13A, Study no: 1

Species	Percent Cover '99
Amelanchier utahensis	.80
Pinus edulis	4

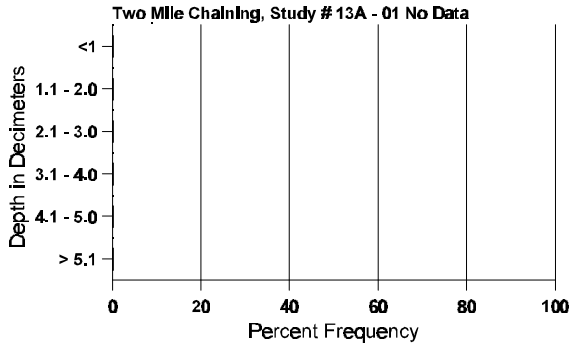
BASIC COVER --
Herd unit 13A, Study no: 1

Cover Type	Nested Frequency '94	Nested Frequency '99	Average Cover % '87	Average Cover % '94	Average Cover % '99
Vegetation	333	336	15.25	33.38	39.61
Rock	10	3	0	.02	.00
Pavement	18	22	0	.03	.04
Litter	387	345	61.00	46.05	40.37
Cryptogams	111	179	3.50	1.50	8.07
Bare Ground	301	265	20.25	32.20	29.56

SOIL ANALYSIS DATA --
Herd Unit 13A, Study # 01, Study Name: Two Mile Chaining

Effective rooting depth (cm)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
11.0	58.6 (11.7)	6.5	48.2	30.6	21.3	2.0	8.0	105.6	0.4

Stoniness Index



PELLET GROUP DATA --
Herd unit 13A, Study no: 1

Type	Quadrat Frequency '94	Quadrat Frequency '99	Pellet Transect Days Use/Acre (ha) '99
Rabbit	44	6	N/A
Elk	28	26	70 (173)
Deer	14	28	32 (79)
Cattle	-	2	6 (15)

BROWSE CHARACTERISTICS --
Herd unit 13A, Study no: 1

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier utahensis																		
S	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
Y	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	6	-	-	3	-	-	-	-	-	9	-	-	-	180			9
	99	2	2	-	-	-	1	-	-	-	5	-	-	-	100			5
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	8	5	1	-	-	-	-	-	-	14	-	-	-	280	41	42	14
	99	1	2	3	2	4	1	-	2	-	15	-	-	-	300	51	53	15
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	2	-	-	-	-	-	-	2	40			2
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	+86%
'94	21%	04%	00%	- 8%
'99	36%	32%	09%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	66	Dec:	0%
	'94	480		4%
	'99	440		9%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	45	-	-	2	-	-	-	-	-	47	-	-	-	940			47
	99	17	-	-	1	-	-	-	-	-	18	-	-	-	360			18
Y	87	2	1	1	-	-	-	-	-	-	4	-	-	-	266			4
	94	10	-	-	-	-	-	-	-	-	10	-	-	-	200			10
	99	15	12	-	-	-	-	-	-	-	27	-	-	-	540			27
M	87	20	15	3	-	-	-	-	-	-	37	-	1	-	2533	13	17	38
	94	96	26	3	4	-	-	-	-	-	121	-	8	-	2580	18	32	129
	99	76	48	1	2	1	1	-	-	-	128	-	1	-	2580	21	31	129
D	87	2	4	-	-	-	-	-	-	-	6	-	-	-	400			6
	94	94	4	2	1	-	-	-	-	-	85	-	3	13	2020			101
	99	20	22	4	2	-	-	-	-	-	43	-	-	5	960			48
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	120			6
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	280			14

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	42%	08%	02%	
'94	13%	02%	10%	+33%
'99	41%	03%	03%	-15%

Total Plants/Acre (excluding Dead & Seedlings)				
'87	3199	Dec:		13%
'94	4800			42%
'99	4080			24%

Chrysothamnus depressus																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	28	-	-	-	-	-	-	-	-	28	-	-	-	560	16	22	28
	99	46	26	-	2	-	-	-	-	-	74	-	-	-	1480	4	9	74
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	+65%
'99	33%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:		-
'94	560			-
'99	1580			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus viscidiflorus																		
S	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	121	-	-	4	-	-	-	-	-	125	-	-	-	2500			125
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	23	-	-	-	-	-	-	-	-	22	-	1	-	1533			23
	94	12	-	-	-	-	-	-	-	-	12	-	-	-	240			12
	99	24	-	-	-	-	-	-	-	-	24	-	-	-	480			24
M	87	56	13	1	-	-	-	-	-	-	69	1	-	-	4666	5	8	70
	94	348	-	-	4	-	-	-	-	-	348	-	-	4	7040	9	20	352
	99	377	9	-	10	-	-	-	-	-	396	-	-	-	7920	5	10	396
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	2	1	-	1	-	-	-	-	-	3	-	-	1	80			4
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	14%	01%	01%	+15%
'94	00%	00%	01%	+14%
'99	02%	00%	.23%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	6199	Dec:	0%
	'94	7300		0%
	'99	8480		1%

Cowania mexicana stansburiana																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	20		-

Coleogyne ramosissima																		
M	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66	11	4	1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	66	Dec:	-
	'94	0		-
	'99	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Coryphantha vivipara arizonica																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60	3	5	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)			
	'87	0	Dec: -
	'94	0	-
	'99	60	-

Eriogonum microthecum																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	14	-	-	-	-	-	-	-	-	14	-	-	-	280	8	8	14
	99	14	3	-	2	-	-	-	-	-	19	-	-	-	380	5	7	19

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	+30%
'99	15%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
	'87	0	Dec: -
	'94	280	-
	'99	400	-

Gutierrezia sarothrae																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66	8	6	1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	7	9	0
	99	7	-	-	-	-	-	-	-	-	7	-	-	-	140	11	8	7

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)			
	'87	66	Dec: -
	'94	0	-
	'99	160	-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	12	-	-	-	-	-	-	-	-	12	-	-	-	240			12
	99	20	-	-	-	-	-	-	-	-	20	-	-	-	400			20
M	87	3	-	-	-	-	-	-	-	-	1	-	2	-	200	3	6	3
	94	49	2	-	-	-	-	-	-	-	46	-	5	-	1020	2	7	51
	99	43	-	-	-	-	-	-	-	-	43	-	-	-	860	3	9	43
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	11	-	-	-	-	-	-	-	-	11	-	-	-	220			11
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	67%	
'94	03%	00%	07%	+86%
'99	00%	00%	00%	-11%

Total Plants/Acre (excluding Dead & Seedlings)				
'87	200	Dec:		0%
'94	1480			15%
'99	1320			5%

Pinus edulis																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	3	-	-	1	-	-	-	-	-	4	-	-	-	80			4
Y	87	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	9	-	-	-	-	-	-	-	-	9	-	-	-	180			9
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	6	-	-	-	-	-	-	2	-	8	-	-	-	160	-	-	8

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	133	Dec:		-
'94	0			-
'99	340			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Purshia tridentata																		
S	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	12	28	0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	12	40	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:		-
'94	0			-
'99	20			-

Quercus gambelii																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	1	-	-	1	-	-	-	20			1
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	-	-	-	8	-	-	9	-	-	-	180	43	18	9

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:		-
'94	0			-
'99	220			-

Symphoricarpos oreophilus																		
S	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	2	1	-	1	-	-	-	-	-	4	-	-	-	80	8	19	4
	99	-	-	-	1	-	-	-	-	-	1	-	-	-	20	22	36	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	25%	00%	00%	-50%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:		-
'94	80			-
'99	40			-

Trend Study 13A-2-99

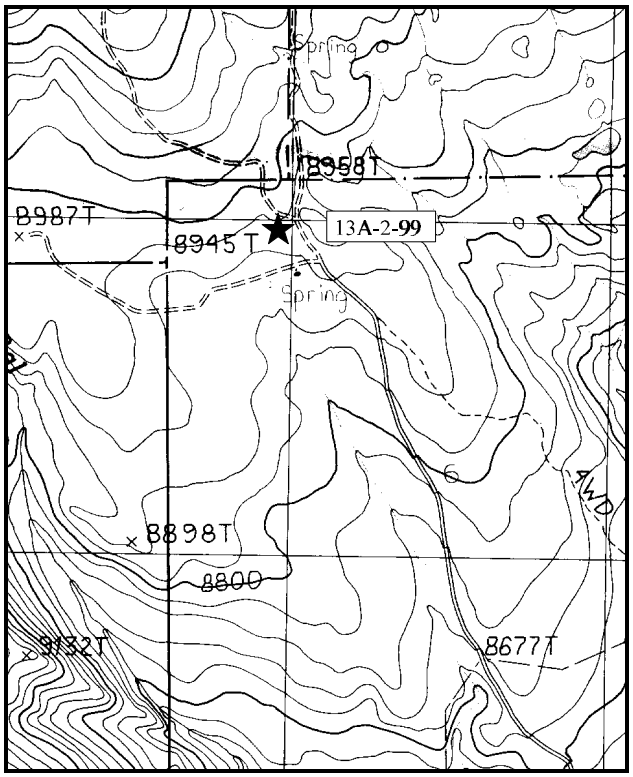
Study site name: East LaSal Pass . Range type: Quaking Aspen .

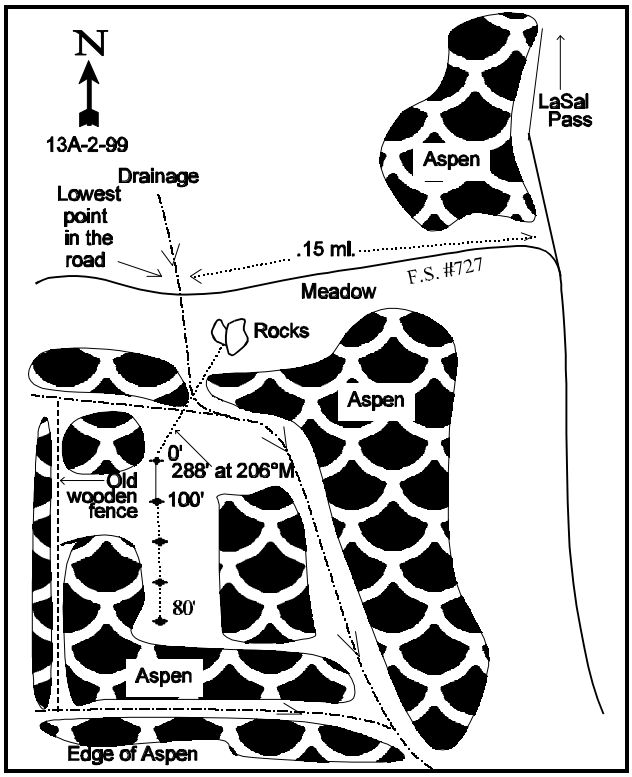
Compass bearing: frequency baseline 165°M .

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

On SR 46, travel northeast past LaSal to mile marker 12. Continue 0.75 miles to the LaSal Pass road. Turn left and go 1.9 miles to a fork just beyond the Forest Service boundary cattleguard. Bear left and go 0.05 miles to a canal. Continue 0.7 miles to a fork by the canal. Stay right, go 0.1 miles to a fork. Stay left and proceed 0.4 miles to another fork. Stay right on main road and continue 0.8 miles to the LaSal Creek crossing. Continue 1.0 mile to a cattleguard. Continue 0.8 miles to a fork. Turn left on FS Road #727 and drive 0.15 miles to the center of the meadow near the lowest point in the road. In the meadow to the left, several boulders mark the starting place to pace off to find the transect starting point. The 0 foot stake can be found 288 feet away in the aspens at a bearing of 206°M. The 0, 200, and 400 foot stakes are full high fenceposts. The 100 and 300 stakes are half high fenceposts.





Map Name: Mount Peale Diagrammatic Sketch

Township 28S , Range 25E , Section 6 UTM 4251755.630 N, 655865.120 E

DISCUSSION

Trend Study No. 13A-2 (33-2)

The East LaSal Pass study is south of Mt. Peale and is characterized by aspen hillsides and large, wet meadows, which provide both deer and elk with high quality summer range. However, the meadows are dominated by iris, which is an increaser with heavy grazing. The area has a high water table with many springs. The study itself is in one of the more mature aspen stands at an elevation of 8,900 feet. There is no prevailing aspect as the sampled area is basically level. The large bench below the conifer-covered peaks slopes gently to many natural drainages which generally drain to the southeast.

The soil is a light-textured, dark loam soil with abundant organic matter (nearly 6%). The top layer is covered with duff and thick vegetative cover. The soil appears to be quite deep (effective rooting depth of almost 22 inches) with a few scattered boulders on the surface. The soil is moderately acidic (6.0 pH) with only 7.9 ppm of phosphorus. This could be a limiting factor to the site because a minimum of 10ppm is required for normal plant development. There are no signs of erosion within the aspens, although the soil could easily be disturbed. The meadows and stream banks show some signs of erosion.

Line intercept data from 1999 estimates average canopy cover of this uneven-aged aspen stand at 54%. Values are quite variable for canopy cover over the length of the transect. Point quarter data taken during the 1994 reading estimates 247 aspen trees/acre and 21 Douglas fir trees/acre on the site. In 1999, point quarter data indicated a slight increase in the aspen population to 267 trees/acre, while the Douglas fir population remained the same. Average diameter of aspen is 9.5 inches in 1994 and 11.25 inches in 1999. Downed trees are prevalent and the naturally occurring openings that are created are the major sources for aspen regeneration. The young trees average three feet in height, making them all available, but show only light to moderate use and are vigorous. Snowberry is common and quite dense in some spots. It has a density of approximately 4,000 plants/acre with almost 80% of them classified as mature plants that are only lightly hedged. Other woody species are uncommon. Browse cover only contributes 8% of the total vegetative cover.

The most abundant herbaceous species are rather large forbs; thickleaf peavine, northern bedstraw, blunt seed sweet root, and common dandelion. These four species alone make up more than 80% of the total forb cover, and the forbs make up more than 60% of the total vegetative cover. These species along with an understory of Kentucky bluegrass and Carex, form a thick protective carpet. There is abundant regeneration both the grasses and forbs. Forbs are especially diverse with 15-17 species being encountered through the years.

The dense herbaceous understory provides excellent ground cover. Litter cover is very high, but it has varied through the years from 75% (1994) to 92% (1999), due to a thick layer of duff. Bare soil is almost nonexistent and found only where trees have been uprooted and fallen to the ground.

1994 TREND ASSESSMENT

Soil trend for this site is stable and excellent condition. The browse trend is not as critical as it would be for a winter range, but it would be stable. The trend for the herbaceous understory is stable with a 31% increase in the nested frequency values for the grasses, but a 17% decrease for the forbs which contribute more than three times the plant cover as the grasses do.

TREND ASSESSMENT
soil - stable and in excellent condition
browse - stable but not as important as the herbaceous component
herbaceous understory - stable

1999 TREND ASSESSMENT

Soil trend for this site continues to be stable and in excellent condition. The browse trend is not critical for this site because it is not a winter range, and also that browse only contributes 8% of the total vegetative cover. The trend for browse on this site is stable. The trend for the herbaceous understory is stable with a slight increase in the sum of nested frequency values for the grasses and forbs.

TREND ASSESSMENT
soil - stable and in excellent condition
browse - stable, but not as important as the herbaceous component
herbaceous understory - stable

HERBACEOUS TRENDS --
Herd unit 13A, Study no: 2

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
G	Agropyron trachycaulum	a-	b21	c74	-	9	30	.56	2.99
G	Bromus carinatus	a13	b46	b33	5	20	17	.76	.74
G	Carex spp.	b144	a40	a53	56	17	18	2.17	3.81
G	Dactylis glomerata	b11	a-	a-	4	-	-	-	-
G	Festuca thurberi	a-	ab3	b12	-	1	4	.63	.22
G	Phleum alpinum	-	-	-	-	-	-	-	.00
G	Phleum pratense	a-	b8	b9	-	4	3	.04	.33
G	Poa pratensis	a139	b262	b293	53	80	87	6.32	14.91
G	Stipa columbiana	a-	b26	a-	-	9	-	.93	-
G	Stipa lettermani	-	2	-	-	1	-	.00	-
G	Unknown grass - perennial	4	-	-	2	-	-	-	-
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		311	408	474	120	141	159	11.44	23.01
Total for Grasses		311	408	474	120	141	159	11.44	23.01
F	Achillea millefolium	a10	b33	b55	4	12	19	.30	1.12
F	Agoseris glauca	-	2	2	-	1	2	.00	.01
F	Allium spp.	5	3	1	2	2	1	.01	.00
F	Calochortus gunnisoni	-	2	-	-	2	-	.01	-
F	Corallorhiza spp.	b6	a-	a-	3	-	-	-	-
F	Delphinium nuttallianum	b7	a-	a-	4	-	-	-	-
F	Erigeron speciosus	-	2	3	-	1	1	.03	.03
F	Fragaria virginiana	-	-	2	-	-	1	-	.15

Type	Species	Nested Frequency '87	'94	'99	Quadrat Frequency '87	'94	'99	Average Cover % '94	'99
F	Galium boreale	$_{a}$100	$_{ab}$137	$_{b}$156	41	50	60	2.60	3.70
F	Iris missouriensis	2	-	6	1	-	2	.03	.06
F	Lathyrus lanszwertii	$_{b}$284	$_{a}$239	$_{b}$261	92	86	85	24.76	21.55
F	Ligusticum porteri	$_{a}$-	$_{a}$-	$_{b}$9	-	-	5	-	1.07
F	Lomatium spp.	$_{b}$30	$_{ab}$15	$_{a}$4	13	7	2	.31	.09
F	Osmorhiza depauperata	$_{c}$318	$_{a}$173	$_{b}$227	95	67	84	2.92	11.39
F	Pterospora andromedea	-	-	1	-	-	1	-	.00
F	Senecio serra	$_{ab}$1	$_{b}$4	$_{a}$-	1	3	-	.01	-
F	Taraxacum officinale	102	107	125	48	41	52	1.64	4.77
F	Thalictrum fendleri	$_{a}$2	$_{ab}$8	$_{b}$17	1	3	5	.33	1.46
F	Thermopsis montana	6	4	6	3	2	2	.19	.53
F	Unknown forb-perennial	$_{b}$17	$_{a}$-	$_{a}$-	9	-	-	-	-
F	Viola adunca	62	70	36	28	29	18	.72	1.83
F	Vicia americana	$_{a}$67	$_{a}$51	$_{b}$97	29	23	43	1.31	3.42
Total for Annual Forbs		0	0	0	0	0	0	0	0
Total for Perennial Forbs		1019	850	1008	374	329	383	35.20	51.23
Total for Forbs		1019	850	1008	374	329	383	35.20	51.23

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 13A, Study no: 2

Type	Species	Strip Frequency '94	'99	Average Cover % '94	'99
B	Pinus ponderosa	-	-	-	.15
B	Populus tremuloides	2	37	.11	.75
B	Ribes montigenum	2	2	.38	.38
B	Rosa woodsii	4	3	.06	.03
B	Symphoricarpos oreophilus	83	74	5.06	5.31
Total for Browse		91	116	5.62	6.62

CANOPY COVER --
Herd unit 13A, Study no: 2

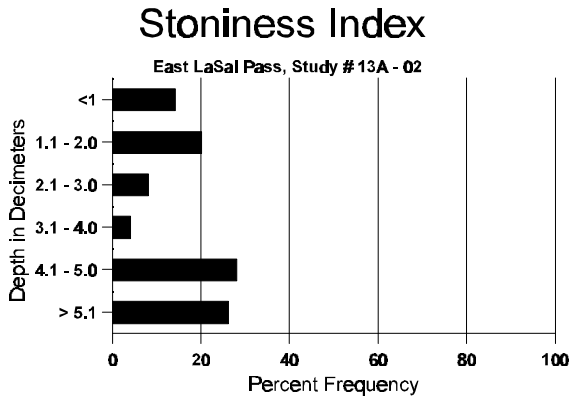
Species	Percent Cover '99
Populus tremuloides	54

BASIC COVER --
Herd unit 13A, Study no: 2

Cover Type	Nested Frequency '94	Nested Frequency '99	Average Cover % '87	Average Cover % '94	Average Cover % '99
Vegetation	353	368	8.00	49.04	73.12
Rock	3	2	.25	.15	.15
Pavement	-	-	0	0	0
Litter	392	399	90.00	75.38	91.84
Cryptogams	-	15	0	0	.95
Bare Ground	15	3	1.75	.48	.15

SOIL ANALYSIS DATA --
Herd Unit 13A, Study # 02, Study Name: East LaSal Pass

Effective rooting depth (cm)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
21.6	43.0 (17.6)	6.0	46.2	30.6	23.3	5.63	7.9	1180.4	0.4



PELLET GROUP DATA --
Herd unit 13A, Study no: 2

Type	Quadrat Frequency '94	Quadrat Frequency '99
Elk	-	2
Deer	2	-

Pellet Transect Days Use/Acre (ha) '99
0
N/A

BROWSE CHARACTERISTICS --
Herd unit 13A, Study no: 2

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Populus tremuloides																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	99	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
Y	87	7	3	-	-	-	-	-	-	-	10	-	-	-	333			10
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	99	34	-	-	4	-	-	-	-	-	38	-	-	-	760			38
M	87	-	-	-	-	-	-	-	3	-	3	-	-	-	100	393	219	3
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1
	99	-	-	-	-	2	-	-	17	-	19	-	-	-	380	-	-	19
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	240			12

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	23%	00%	00%	-86%
'94	00%	00%	00%	+95%
'99	04%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	433	Dec:	-
	'94	60		-
	'99	1140		-

Ribes montigenum																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	3	-	-	-	-	-	-	-	-	3	-	-	-	60	18	139	3
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60	38	28	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	+50%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	60		-
	'99	120		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Rosa woodsii																		
Y	87	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	94	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
	99	-	-	2	-	-	-	-	-	-	2	-	-	-	40			2
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40	16	6	2
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40	13	5	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	+82%
'94	00%	00%	00%	-56%
'99	00%	50%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	33	Dec:	-
	'94	180		-
	'99	80		-

Symphoricarpos oreophilus																		
S	87	19	-	-	-	-	-	-	-	-	19	-	-	-	633			19
	94	2	-	-	1	-	-	-	-	-	3	-	-	-	60			3
	99	27	-	-	1	-	-	-	-	-	28	-	-	-	560			28
Y	87	80	27	2	-	-	-	-	-	-	97	4	8	-	3633			109
	94	76	-	-	4	-	-	-	-	-	68	12	-	-	1600			80
	99	35	-	-	2	-	-	-	-	-	37	-	-	-	740			37
M	87	49	39	3	-	-	-	-	-	-	89	1	1	-	3033	27	25	91
	94	142	-	-	-	-	-	-	-	-	134	8	-	-	2840	21	23	142
	99	157	2	-	1	-	-	-	-	-	160	-	-	-	3200	22	21	160
D	87	3	9	1	-	-	-	-	-	-	11	1	1	-	433			13
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	2	-	-	-	-	-	3	-	-	-	60			3
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	35%	03%	05%	-37%
'94	00%	00%	00%	-10%
'99	01%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	7099	Dec:	6%
	'94	4440		0%
	'99	4000		2%

Trend Study 13A-3-99

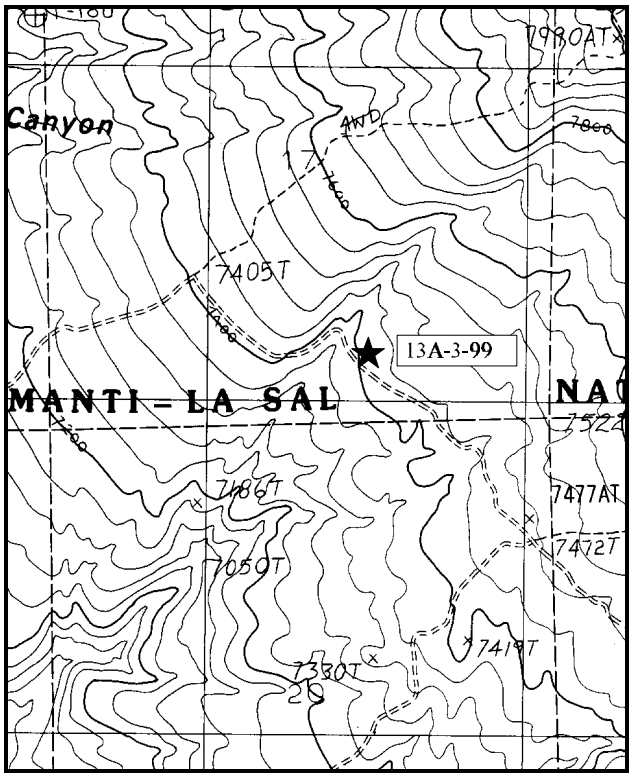
Study site name: Buck Hollow . Range type: Chained, Seeded P-J .

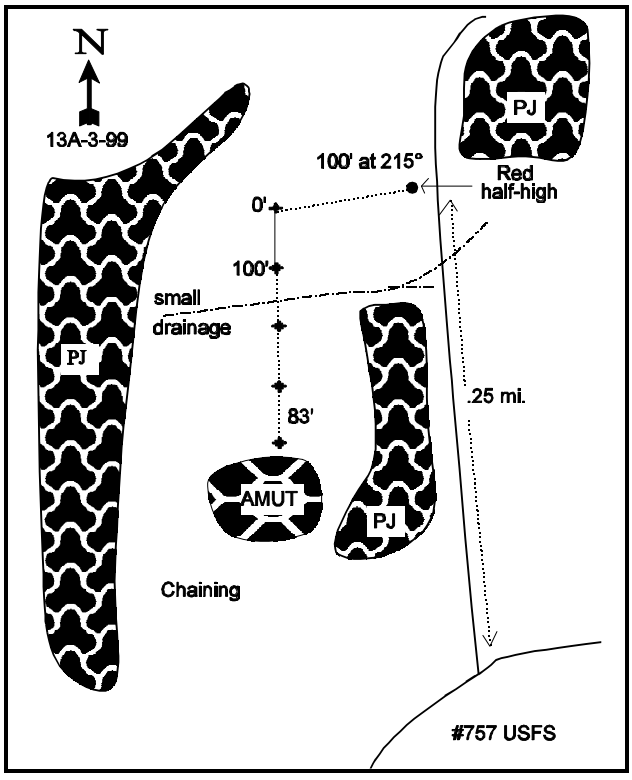
Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From LaSal Junction, proceed east on SR 46 for 0.3 miles past mile marker 5. Turn left onto County Road 130 and travel 2.95 miles to a fork. Bear right on road #166 and go 0.8 miles to another fork. Bear right, and continue 1.3 miles to a cattleguard marking the Forest Service boundary. Continue 1.55 miles to a fork, turn left and go 0.25 miles. A witness post (1 ½ foot tall fencepost) is located on the left side of the road. The transect starts 100 feet out in the chaining. The study is marked by half high green fenceposts.
***An alternate route is to take SR 191 south from Moab. At mile marker 113, continue 0.15 miles south and turn left (east) on county road #166. Continue south on main road for 11.4 miles to a fork, and turn left (east). Go 1.3 miles to the cattleguard and Forest Service boundary listed above. Follow remainder of dirtections as noted above.





Map Name: LaSal West Diagrammatic Sketch

Township 28S , Range 24E , Section 17 UTM 4247658.608 N, 647773.460 E

DISCUSSION

Trend Study No. 13A-3 (33-3)

The Buck Hollow study samples a chaining within the wide-ranging pinyon-juniper type on the south slope of the LaSal Mountains. This area is thought to be particularly important as a principal elk wintering area. As of 1999, there was an estimated 66 deer days use/acre (163 ddu/ha), 15 elk days use/acre (37 edu/ha), and 20 cow days use/acre (49 cdu/ha) on the site. The 700 acre Buck Hollow chaining and seeding project was completed in 1982. The site is now dominated by seeded grasses which currently contribute 62% of the total vegetative cover. Scattered clumps of unchained, mature pinyon-juniper provide excellent escape cover. This woodland community was an old, very mature stand when it was chained. The elevation of the site is 7,300 feet with a general aspect to the southwest on a gentle south-facing slope (5-7%).

The moderately deep soil on this rangeland site has an effective rooting depth of almost 13 inches. The soil is a reddish-brown sandy clay loam with stones throughout the upper profile. It is mildly alkaline (7.6 pH) and shows little evidence of erosion within the chained area. Besides the good cover of perennial grasses, litter left in place from the chaining also provides excellent soil protection. There is definite soil movement in the surrounding mature pinyon-juniper woodland type.

Besides scattered clumps of serviceberry and true mountain mahogany, there is little other desirable browse within the chaining. Most of the mature seed-producing plants occur nearby on the edge of the chaining. The browse population on the site is mainly made up of young plants, just getting established. Four-wing saltbush was seeded, but no plants were sampled on the transect. Some nearby plants were measured for height/crown. There are some patches of Gambel oak that are lightly browsed. There were abundant seedlings in 1987, which were all growing around the mature plants. However, no seedlings have been found since. There is some reinvading and/or releasing of pinyon and juniper within the chaining. The point-quarter method estimated 64 juniper trees/acre and 115 pinyon trees/acre. Average diameter of juniper was 3.3 inches while that of pinyon was 3.9 inches.

Seeded grasses are the prevalent forage available in this chaining. These large vigorous plants are mainly smooth brome, intermediate wheatgrass, and crested wheatgrass. Combined, they represented 96% of the grass cover and 70% of the total vegetative cover in 1994. At the present time, the numbers are very similar. Combined, they now contribute 97% of the grass cover and 62% of the total vegetative cover. Several other species are present, including tall wheatgrass, orchardgrass, Indian ricegrass, bottlebrush squirreltail, Carex, and an *Elymus* species. Forbs are not as essential because they only contribute about 20% of the total vegetative cover. The most abundant forb is alfalfa, which makes up 70% of the forb cover.

APPARENT TREND ASSESSMENT

Excellent ground cover is provided by the dense mixture of bunch and rhizomatous grass species. Herbaceous understory cover is excellent. Litter cover is also quite high at 61% (53% in 1994). There is a scattering of rock and pavement cover totaling less than 10%. Percent bare ground is only at 12% (14% in 1994).

1994 TREND ASSESSMENT

The soil trend should be considered stable at this time as there is still a generous amount of litter cover from the chaining and herbaceous cover is excellent with only about 14% bare ground. The browse species are not a very significant contributor to the productivity of the site for they only make up 15% of the total vegetative cover, with almost all of that coming from small pinyon. Trend for browse is stable but it is an insignificant contributor to the productivity of the site. Within the herbaceous understory, the seeded species make up 80% of the total vegetative cover. The nested frequency values for the grasses have gone down slightly with the nested frequency of forbs going up slightly; trend for the herbaceous understory is stable.

TREND ASSESSMENT
soil - stable
browse - stable, but almost nonexistent
herbaceous understory - stable

1999 TREND ASSESSMENT

The soil trend is considered to be improving with improved ratios of protective cover to bare soil. Vegetative cover and litter cover have increased, with a corresponding decrease in percent bare soil. The browse species are still not a very significant contributor to the productivity of the site as they only make up 14% of the total vegetative cover, with almost all of that coming from small pinyon. Trend for browse is stable but it continues to be an insignificant contributor to the productivity of the site. The majority of the herbaceous species cover comes from seeded species which make up 77% of the total vegetative cover. The nested frequency values for the grasses have gone up slightly with the nested frequency for forbs going down slightly. Because grasses almost triple the cover of the forbs, overall trend for the herbaceous understory is stable.

TREND ASSESSMENT
soil - improving
browse - stable, but almost nonexistent
herbaceous understory - stable

HERBACEOUS TRENDS --
Herd unit 13A, Study no: 3

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
G	Agropyron cristatum	$_{b}$119	$_{a}$58	$_{a}$80	54	28	33	.88	2.45
G	Agropyron intermedium	$_{b}$290	$_{a}$208	$_{a}$205	89	71	71	6.18	6.94
G	Bromus inermis	$_{a}$150	$_{b}$208	$_{b}$231	56	66	78	7.42	10.11
G	Carex spp.	9	23	19	5	10	9	.46	.44
G	Oryzopsis hymenoides	$_{b}$5	$_{a}$-	$_{a}$-	3	-	-	-	.00
G	Poa fendleriana	-	3	8	-	1	4	.03	.09
G	Poa secunda	-	-	6	-	-	2	-	.06
G	Sitanion hystrix	$_{b}$34	$_{b}$21	$_{a}$3	16	11	1	.13	.03
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		607	521	552	223	187	198	15.12	20.14
Total for Grasses		607	521	552	223	187	198	15.12	20.14
F	Alyssum spp. (a)	-	-	-	-	-	-	.00	-
F	Arabis hirsuta	2	-	6	2	-	2	-	.01
F	Astragalus convallarius	18	21	22	7	11	12	.37	1.35
F	Aster spp.	-	2	-	-	1	-	.03	-
F	Chaenactis douglasii	3	3	-	1	2	-	.01	-
F	Collinsia parviflora (a)	-	3	-	-	1	-	.00	-
F	Cruciferae	4	-	-	2	-	-	-	-

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
F	Cryptantha spp.	$_{a}$-	$_{b}$17	$_{a}$4	-	8	2	.06	.01
F	Descurainia pinnata (a)	-	7	1	-	3	1	.01	.01
F	Gilia spp. (a)	-	3	-	-	1	-	.00	-
F	Lesquerella spp.	$_{b}$22	$_{a}$-	$_{a}$-	13	-	-	-	-
F	Machaeranthera spp	-	1	-	-	1	-	.00	-
F	Melilotus officinalis	$_{c}$53	$_{b}$18	$_{a}$-	25	7	-	.16	-
F	Medicago sativa	$_{a}$1	$_{b}$28	$_{b}$27	1	13	12	1.64	4.81
F	Penstemon spp.	$_{a}$-	$_{b}$24	$_{b}$21	-	11	9	.13	.17
F	Phacelia spp.	$_{b}$10	$_{a}$-	$_{a}$-	6	-	-	-	-
F	Phlox austromontana	$_{a}$-	$_{b}$14	$_{b}$10	-	7	4	.25	.09
F	Physaria chambersii	$_{a}$-	$_{b}$14	$_{b}$16	-	7	6	.03	.20
F	Polygonum douglasii (a)	-	10	1	-	5	1	.02	.00
F	Sanguisorba minor	$_{a}$3	$_{b}$-	$_{b}$-	3	-	-	-	-
F	Senecio multilobatus	-	-	2	-	-	2	-	.03
F	Sphaeralcea coccinea	11	12	15	5	6	7	.25	.28
F	Tragopogon dubius	3	2	-	1	2	-	.03	-
F	Trifolium spp.	-	-	2	-	-	1	-	.03
F	Unknown forb-perennial	4	-	-	2	-	-	-	-
Total for Annual Forbs		0	23	2	0	10	2	0.05	0.01
Total for Perennial Forbs		134	156	125	68	76	57	3.00	7.01
Total for Forbs		134	179	127	68	86	59	3.05	7.02

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 13A, Study no: 3

Type	Species	Strip Frequency		Average Cover %	
		'94	'99	'94	'99
B	Amelanchier utahensis	2	0	-	-
B	Atriplex canescens	0	0	-	-
B	Cercocarpus montanus	4	4	-	.15
B	Juniperus osteosperma	0	4	-	.15
B	Opuntia spp.	0	1	-	-
B	Pinus edulis	0	4	2.64	3.98
B	Symphoricarpos oreophilus	1	0	-	-
Total for Browse		7	13	2.64	4.28

CANOPY COVER --
Herd unit 13A, Study no: 3

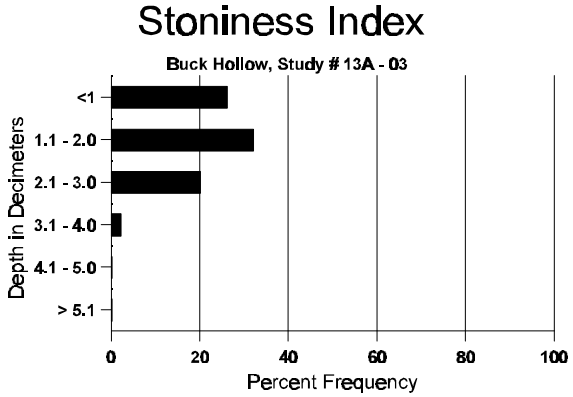
Species	Percent Cover '99
Juniperus osteosperma	2
Pinus edulis	4

BASIC COVER --
Herd unit 13A, Study no: 3

Cover Type	Nested Frequency '94	Nested Frequency '99	Average Cover % '87	Average Cover % '94	Average Cover % '99
Vegetation	332	329	11.25	24.78	34.29
Rock	192	141	2.50	4.80	5.32
Pavement	195	185	2.25	.96	4.56
Litter	386	389	72.75	53.42	61.43
Cryptogams	-	9	0	0	.12
Bare Ground	246	186	11.25	14.31	12.04

SOIL ANALYSIS DATA --
Herd Unit 13A, Study # 03, Study Name: Buck Hollow

Effective rooting depth (cm)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
12.6	590.4 (15.2)	7.6	52.9	21.8	25.3	4.5	25.0	144.0	0.7



PELLET GROUP DATA --
Herd unit 13A, Study no: 3

Type	Quadrat Frequency '94	Quadrat Frequency '99
Rabbit	10	19
Elk	14	12
Deer	17	29
Cattle	2	6

Pellet Transect Days Use/Acre (ha) '99
N/A
15 (37)
66 (163)
20 (49)

BROWSE CHARACTERISTICS --
Herd unit 13A, Study no: 3

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier utahensis																		
S	87	21	-	-	-	-	-	-	-	-	21	-	-	-	700			21
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	9	6	1	-	-	-	1	-	-	15	-	2	-	566			17
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	-	2	-	-	1	-	-	-	-	3	-	-	-	100	59	28	3
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20	66	75	1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	59	73	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	45%	05%	10%	-94%
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	666	Dec:	-
	'94	40		-
	'99	0		-

Cercocarpus montanus																		
Y	87	-	-	1	-	-	-	-	-	-	1	-	-	-	33			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	-	1	-	-	-	-	-	-	-	1	-	-	-	33	21	19	1
	94	4	1	-	-	-	-	-	-	-	5	-	-	-	100	33	30	5
	99	1	2	-	-	2	-	-	-	-	5	-	-	-	100	48	38	5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	50%	50%	00%	+34%
'94	20%	00%	00%	+ 0%
'99	80%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	66	Dec:	-
	'94	100		-
	'99	100		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
S	87	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
M	87	1	-	-	-	-	-	-	-	-	1	-	-	-	33	51	197	1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	33	Dec:	-
	'94	0		-
	'99	100		-

Opuntia spp.																		
M	87	1	-	-	-	-	-	-	-	-	1	-	-	-	33	12	6	1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4	19	0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	8	18	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	33	Dec:	-
	'94	0		-
	'99	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pinus edulis																		
S	87	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	2	-	-	-	-	-	1	-	-	3	-	-	-	100			3
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	87	1	-	-	-	-	-	-	-	-	1	-	-	-	33	35	24	1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	1
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
'87	133	Dec:		-
'94	0			-
'99	100			-

Symphoricarpos oreophilus																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20	30	55	1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	26	52	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:		-
'94	20			-
'99	0			-

Trend Study 13A-4-99

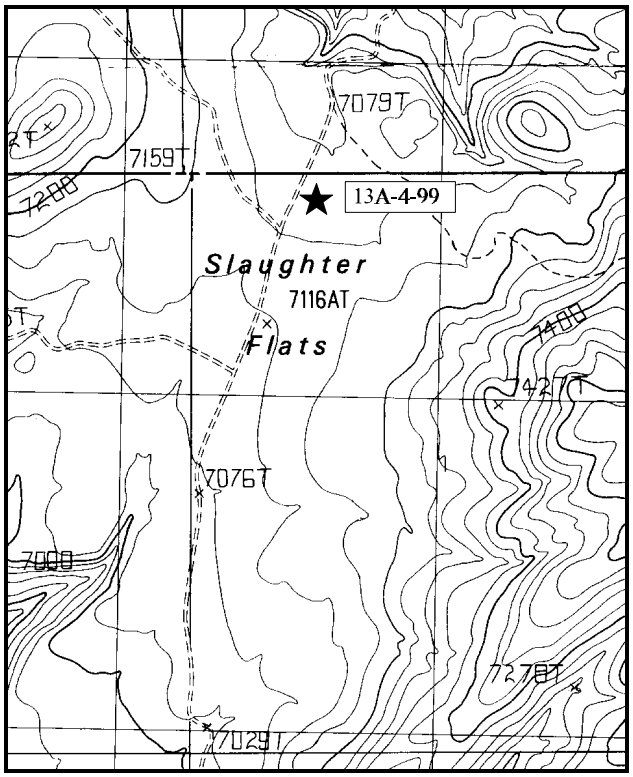
Study site name: Slaughter Flat . Range type: Chained, Seeded P-J .

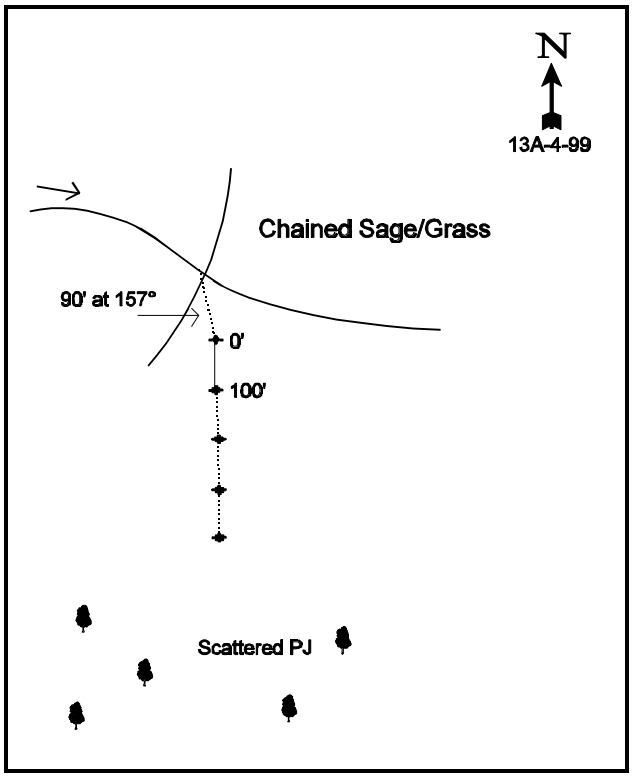
Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Turn east on the Black Ridge Road 0.15 miles south of mile marker 113 on SR 191 south of Moab. Proceed up canyon 3.65 miles to a fork by a stock pond. Bear right up the dugway for 1.15 miles to a fork. Stay left (road #116), go 1 mile to another fork. Stay left, proceed 0.6 miles to a fork. Stay right, proceed 0.35 miles to the powerlines. Pass under the powerlines and across a road. Continue 0.7 miles to a fence (Forest Service boundary). Proceed through the gate, go 1.7 miles to a crossroads in a large chained flat. The transect is located in the SE quarter, marked by short fence posts. The 0-foot baseline stake is tagged #7125.





Map Name: Mount Tukuhnikivatz

Diagrammatic Sketch

Township 28S , Range 23E , Section 1

UTM 4251046.374 N, 644362.910 E

DISCUSSION

Trend Study No. 13A-4 (33-4)

The Slaughter Flat Study area has long been recognized as important big game winter range. In 1999, pellet group transects indicated use at 25 deer days use/acre (62 ddu/ha), 53 elk days use/acre (131 edu/ha), and 22 cow days use/acre (53 cdu/ha). In 1974, 940 acres were chained and seeded. It is successionally now a sagebrush-grass community. This Forest Service land is grazed using a combination rest/deferred rotation system from mid-June through mid-October.

The transect is located in an open flat valley between pinyon-juniper ridges to the east and west. The chaining extends to the north. Due to the level valley bottom, there is not a distinguishable aspect for the site and slope is negligible. The site elevation is approximately 7,100 feet, which drains to the east.

The orange, sandy clay loam soil is moderately deep (effective rooting depth of almost 14 inches), with a loose structure on the surface. The soil has a neutral pH (7.2) and an above normal organic matter content in the soil surface. There is soil loss from the bare interspaces and evidence of sheet and rill erosion, but no gullies are on the site. There is some pedestaling of the bunch grasses.

Wyoming big sagebrush is the key browse species on the site. Identification of the *Artemisia* subspecies was difficult because of hybridization with other sagebrush subspecies and different varieties which may have been seeded onto the site after the chaining treatment. The most frequently found sagebrush subspecies on this site would be Wyoming big sagebrush. The sagebrush made up 60% of the browse cover in 1994, and 56% in 1999. There has been steady, but slight decrease in the sagebrush population since 1987. The population has gone from 3,298 plants/acre (1987), to 2,940 plants/acre (1994), to it's current level at 2,560 plants/acre (1999). The population has shown through the years, varying amounts of use, but not use that should cause this kind of loss. Thus, sagebrush loss has most likely been caused by years of extended drought and associated winter injury. The proportion of the population that shows heavy use has never exceeded 22%. Percent decadency has increased from 10% to 20%. Twenty-six percent of the population was classified as young in 1987, now this is only 16%. Biotic potential has varied greatly through the years, 0% in 1987, 12% in 1994, and only 2% in 1999. The larger, more vigorous plants (which display characteristics of Basin big sagebrush) appear to produce the most seed and show only light to moderate hedging, as opposed to the appearance of moderate to heavy hedging on the relatively smaller, mature individuals that resemble more that of Wyoming big sagebrush. Low rabbitbrush is prominent because of its relatively high density. It has increased from providing 27% to 30% of the browse cover. Other more palatable browse species are uncommon, comprising only a minor percentage of the browse population. The serviceberry, white-stemmed rubber rabbitbrush, and slenderbush eriogonum display good vigor, but sustain moderately heavy use. Overall density of other desirable browse is quite low.

In 1987, it was noted that grasses were an important vegetative component on this site as western wheatgrass was fairly thick in places; but the most abundant perennial species were needle-and-thread, muttongrass, crested wheatgrass, and Indian ricegrass. Total grass cover in 1994 was 15%, which was 43% of the total vegetative cover at that time. Cheatgrass was fairly common throughout and dense in localized areas, yet it only made up 2% of the grass cover. Twenty species of forbs were encountered on the site, but together they contributed to a little more than 3% cover.

In 1999, there were only 7 forb species which contributed to less than 1% of the cover. Of the eight perennial grass species, only crested wheatgrass and western wheatgrass showed significant increases (sum of nested frequency and cover). There were significant losses to needle and thread grass which used to be the most abundant species. There were also significant losses to bottle brush squirreltail, Indian rice grass, Sandberg bluegrass, and mutton bluegrass. Long-term drought has had a detrimental effect on most of the native grasses and forbs. Cheatgrass has greatly increased its deleterious influence on the successional development

of this community. It has increased in cover by over 23 times since 1994.

1994 TREND ASSESSMENT

The trend for the soil is somewhat mixed, but the percentage of bare soil has not shown a significant change and the slight decrease in litter cover is to be expected with the extended drought. Trend for now is considered stable. The trend for the key browse is slightly down. Especially with a ratio of one in eight plants being dead. With the high biotic potential and establishment of the seedlings, this should turn around. The trend for the perennial species in the herbaceous understory is stable.

TREND ASSESSMENT
soil - stable
browse - slightly down
herbaceous understory - stable

1999 TREND ASSESSMENT

The trend for the soil is still somewhat mixed, with the percent bare soil increasing and photo evidence of more pedestaling of herbaceous species. There were also increases in cheatgrass and prickly pear cactus. Trend for soil is slightly down. The trend for the key browse is again slightly down. This is because the ratio of dead to live plants has increased from 1:8 (11%) to 1:5 (17%). Percent decadence has also increased from 10% to 20%. The percentage of decadent plants that are classified as dying has also increased from 33% to 36%. There has also been a significant increase in the low rabbitbrush population. The trend for the perennial species in the herbaceous understory would be down overall, even with the significant increases for crested wheatgrass and western wheatgrass. These increases have not made up for the decreases for the other five native perennial species. Cheatgrass is increasing to where it elevates the hazard of fire which would cause the loss of the sagebrush component and the communities use as a big game winter range.

TREND ASSESSMENT
soil - slightly down
browse - slightly down
herbaceous understory - slightly down

HERBACEOUS TRENDS --
Herd unit 13A, Study no: 4

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
G	Agropyron cristatum	$_{a}$57	$_{a}$79	$_{b}$211	23	30	74	2.23	8.42
G	Agropyron smithii	$_{a}$8	$_{b}$42	$_{c}$64	3	17	25	.31	.49
G	Bromus inermis	-	1	1	-	1	1	.00	.00
G	Bromus tectorum (a)	-	83	237	-	33	73	.32	7.39
G	Oryzopsis hymenoides	$_{a}$24	$_{b}$66	$_{a}$25	12	27	13	1.71	.83
G	Poa fendleriana	$_{c}$232	$_{b}$146	$_{a}$97	78	56	36	3.84	2.91
G	Poa secunda	$_{a}$20	$_{b}$47	$_{a}$14	9	23	5	.53	.07
G	Sitanion hystrix	$_{b}$24	$_{b}$18	$_{a}$1	12	11	1	.13	.03
G	Stipa comata	$_{c}$221	$_{b}$168	$_{a}$26	79	64	10	6.00	.63
G	Vulpia octoflora (a)	-	1	1	-	1	1	.00	.00
Total for Annual Grasses		0	84	238	0	34	74	0.32	7.39
Total for Perennial Grasses		586	567	439	216	229	165	14.77	13.41
Total for Grasses		586	651	677	216	263	239	15.10	20.81

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	ⅈ94	ⅈ99
F	Antennaria spp.	-	3	-	-	1	-	.00	-
F	Arabis spp.	$_{a}$-	$_{b}$17	$_{a}$-	-	8	-	.04	-
F	Astragalus convallarius	$_{a}$11	$_{b}$35	$_{a}$3	5	15	1	1.37	.00
F	Castilleja chromosa	$_{a}$6	$_{b}$4	$_{a}$-	3	3	-	.04	-
F	Cirsium spp.	-	3	-	-	1	-	.00	-
F	Cordylanthus wrightii (a)	$_{b}$16	$_{b}$17	$_{a}$2	8	8	1	.04	.03
F	Crepis acuminata	$_{b}$9	$_{b}$5	$_{a}$-	7	3	-	.01	-
F	Cryptantha spp.	$_{b}$12	$_{b}$8	$_{a}$-	7	5	-	.02	-
F	Draba reptans (a)	-	$_{b}$39	$_{a}$4	-	18	1	.09	.00
F	Erigeron pumilus	8	3	1	5	1	1	.00	.00
F	Gayophytum ramosissimum (a)	-	$_{b}$13	$_{a}$-	-	5	-	.02	-
F	Lappula occidentalis (a)	-	$_{b}$5	$_{a}$-	-	3	-	.01	-
F	Microsteris gracilis (a)	-	$_{b}$73	$_{a}$15	-	28	6	.38	.03
F	Petradoria pumila	-	3	-	-	1	-	.03	-
F	Phlox longifolia	$_{a}$-	$_{b}$98	$_{a}$-	-	44	-	.27	-
F	Polygonum douglasii (a)	-	$_{b}$49	$_{a}$-	-	21	-	.10	-
F	Ranunculus testiculatus (a)	-	$_{b}$12	$_{a}$-	-	4	-	.02	-
F	Sphaeralcea coccinea	$_{a}$17	$_{b}$78	$_{b}$64	9	34	29	.57	.71
F	Taraxacum officinale	$_{a}$1	$_{b}$12	$_{a}$-	1	7	-	.04	-
F	Tragopogon dubius	1	-	-	1	-	-	-	-
F	Trifolium gymnocarpon	$_{b}$118	$_{b}$102	$_{a}$3	56	49	1	.32	.00
F	Unknown forb-perennial	3	-	-	2	-	-	-	-
F	Zigadenus paniculatus	$_{b}$15	$_{a}$-	$_{a}$-	6	-	-	-	-
Total for Annual Forbs		16	208	21	8	87	8	0.68	0.06
Total for Perennial Forbs		201	371	71	102	172	32	2.74	0.72
Total for Forbs		217	579	92	110	259	40	3.43	0.79

Values with different subscript letters are significantly different at ⅈ = 0.10

BROWSE TRENDS --
Herd unit 13A, Study no: 4

Type	Species	Strip Frequency '94	Strip Frequency '99	Average Cover % '94	Average Cover % '99
B	Amelanchier utahensis	0	0	-	-
B	Artemisia tridentata wyomingensis	68	69	10.17	10.57
B	Chrysothamnus nauseosus albicaulis	1	1	-	-
B	Chrysothamnus viscidiflorus	83	86	4.55	5.58
B	Coryphantha vivipara arizonica	0	2	-	.00
B	Eriogonum microthecum	0	1	-	-
B	Gutierrezia sarothrae	6	2	.02	.15
B	Juniperus osteosperma	0	1	.15	.38
B	Opuntia polyacantha	42	44	.89	1.16
B	Pediocactus simpsonii	0	1	-	-
B	Pinus edulis	0	1	1.16	.93
Total for Browse		200	208	16.95	18.79

BASIC COVER --
Herd unit 13A, Study no: 4

Cover Type	Nested Frequency '94	Nested Frequency '99	Average Cover % '87	Average Cover % '94	Average Cover % '99
Vegetation	349	358	12.75	35.90	38.68
Rock	61	15	0	.27	.06
Pavement	118	103	0	.24	.52
Litter	398	370	53.25	39.65	41.77
Cryptogams	24	50	.75	.36	.52
Bare Ground	340	314	33.25	35.01	37.35

SOIL ANALYSIS DATA --
Herd Unit 13A, Study # 04, Study Name: Slaughter Flat

Effective rooting depth (cm)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
130.4	64.8 (14.3)	7.2	52.9	19.8	27.3	1.9	50.4	89.6	0.4

PELLET GROUP DATA --
Herd unit 13A, Study no: 4

Type	Quadrat Frequency '94	Quadrat Frequency '99	Pellet Transect Days Use/Acre (ha) '99
Rabbit	11	19	N/A
Elk	41	34	53 (131)
Deer	14	36	25 (62)
Cattle	1	1	23 (57)

BROWSE CHARACTERISTICS --
Herd unit 13A, Study no: 4

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier utahensis																		
Y	87	-	-	1	-	-	-	-	-	-	1	-	-	-	33			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	44	54	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	37	51	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	100%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	33	Dec:	-
	'94	0		-
	'99	0		-

Artemisia tridentata wyomingensis																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	22	-	-	-	-	-	-	-	-	22	-	-	-	440			22
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
Y	87	17	7	1	1	-	-	-	-	-	24	-	2	-	866			26
	94	19	-	-	-	-	-	-	-	-	19	-	-	-	380			19
	99	19	-	2	-	-	-	-	-	-	21	-	-	-	420			21
M	87	15	31	18	1	-	-	-	-	-	62	-	2	1	2166	23	22	65
	94	95	15	3	-	-	-	-	-	-	89	-	24	-	2260	19	28	113
	99	30	33	18	-	1	-	-	-	-	82	-	-	-	1640	20	28	82
D	87	2	2	3	1	-	-	-	-	-	7	-	1	-	266			8
	94	10	3	-	-	2	-	-	-	-	8	-	2	5	300			15
	99	9	10	5	1	-	-	-	-	-	16	-	-	9	500			25
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	360			18
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	480			24

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	40%	22%	06%	-11%
'94	14%	02%	21%	-13%
'99	34%	20%	07%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	3298	Dec:	8%
	'94	2940		10%
	'99	2560		20%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus nauseosus albicaulis																		
M	87	-	-	1	-	-	-	-	-	-	1	-	-	-	33	31	28	1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	32	27	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	1	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	100%	00%	-39%
'94	00%	00%	00%	+ 0%
'99	100%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	33	Dec:	0%
	'94	20		100%
	'99	20		100%

Chrysothamnus viscidiflorus																		
S	87	3	-	-	-	-	-	-	-	-	3	-	-	-	100			3
	94	65	-	-	4	-	-	-	-	-	69	-	-	-	1380			69
	99	11	-	-	-	-	-	-	-	-	11	-	-	-	220			11
Y	87	36	1	-	-	-	-	-	-	-	37	-	-	-	1233			37
	94	29	-	-	-	-	-	-	-	-	29	-	-	-	780			29
	99	54	2	-	-	-	-	-	-	-	56	-	-	-	1120			56
M	87	69	3	-	-	-	-	-	-	-	72	-	-	-	2400	5	10	72
	94	312	1	-	2	-	-	-	-	-	315	-	-	-	6300	5	12	315
	99	270	36	-	-	-	-	-	-	-	306	-	-	-	6120	5	12	306
D	87	15	-	-	-	-	-	-	-	-	15	-	-	-	500			15
	94	4	-	-	-	-	-	-	-	-	3	-	-	1	80			4
	99	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	03%	00%	00%	+42%
'94	.27%	00%	.27%	+ 2%
'99	10%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	4133	Dec:	12%
	'94	7160		1%
	'99	7340		1%

Coryphantha vivipara arizonica																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40	3	3	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	40		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Eriogonum microthecum																		
M	87	-	-	1	-	-	-	-	-	-	1	-	-	-	33	12	7	1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	1	-	-	-	-	-	1	-	-	-	20	6	9	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	100%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	33	Dec:	-
	'94	0		-
	'99	20		-

Gutierrezia sarothrae																		
S	87	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	94	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	94	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	5	-	-	-	-	-	-	-	-	5	-	-	-	166	7	6	5
	94	5	-	-	-	-	-	-	-	-	5	-	-	-	100	1	2	5
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40	8	10	2
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	-14%
'94	00%	00%	00%	-80%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	232	Dec:	-
	'94	200		-
	'99	40		-

Juniperus osteosperma																		
Y	87	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	33	Dec:	-
	'94	0		-
	'99	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia polyacantha																		
S	87	4	-	-	-	-	-	-	-	-	4	-	-	-	133			4
	94	10	-	-	-	-	-	-	-	-	8	1	1	-	200			10
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	87	13	-	-	-	-	-	-	-	-	12	-	1	-	433			13
	94	28	-	-	-	-	-	-	-	-	21	-	7	-	560			28
	99	17	-	-	-	-	-	-	-	-	17	-	-	-	340			17
M	87	18	-	-	-	-	-	-	-	-	11	-	5	2	600	5	7	18
	94	74	-	-	-	-	-	-	-	-	69	1	4	-	1480	4	16	74
	99	89	-	1	-	-	-	-	-	-	90	-	-	-	1800	4	10	90
D	87	4	-	-	-	-	-	-	-	-	3	-	1	-	133			4
	94	6	-	2	-	-	-	-	-	-	5	-	1	2	160			8
	99	13	-	1	-	-	-	-	-	-	7	-	2	5	280			14
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	240			12

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	26%	+47%
'94	00%	02%	13%	+ 9%
'99	00%	02%	06%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	1166	Dec:	11%	
'94	2200		7%	
'99	2420		12%	

Pediocactus simpsonii																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'87	0	Dec:	-
'94	0		-
'99	20		-

Pinus edulis																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'87	0	Dec:	-
'94	0		-
'99	20		-

Trend Study 13A-5-99

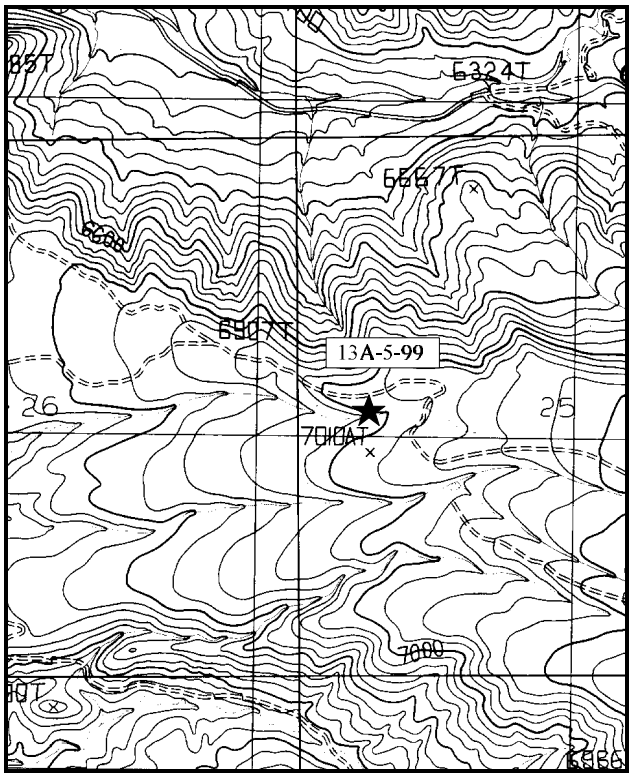
Study site name: Amasas Back . Range type: Chained, Seeded P-J .

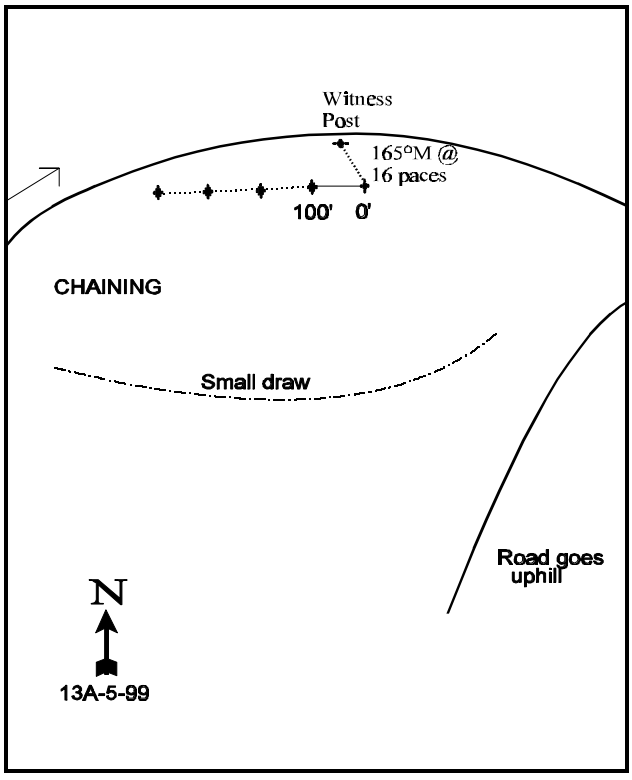
Compass bearing: frequency baseline 255°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Traveling south on SR 191 out of Moab, turn east off the highway onto a dirt road just past mile marker 114. Cross the cattleguard and stay right, continuing on the main road for 0.7 miles to a fence. Continue 1.3 miles to a fork. Stay left and go 0.4 miles to another fence. Continue 1.0 miles to a fork. Stay left, go 1.2 miles to the Forest Service boundary cattleguard. Cross the cattleguard and continue 1.5 miles to a witness post. The o foot stake is 16 paces from the witness post at a bearing of 165°M. The 0-foot stake is marked by browse tag #7859.





Map Name: Mount Tukuhnikivatz Diagrammatic Sketch

Township 27S , Range 23E , Section 25 UTM 4254124.026 N, 644396.348 E

DISCUSSION

Trend Study No. 13A-5 (33-5)

The Amasas Back study site is another area of critical big game winter range on the west side of the LaSal mountains. This can be illustrated by the pellet group transects done on the site in 1999 which showed 34 deer days use/acre (84 ddu/ha) and 54 elk days use/acre (133 edu/ha). This study samples a 750 acre chaining and seeding project that was completed in 1978 on the lower elevational limits of Forest Service administered land. The site demonstrates moderate encroachment of pinyon and juniper which has initiated some discussion and planning for future treatment with a roller-chopper. Point quarter data from 1994 and 1999 show densities that are almost the same with estimates of 89 trees/acre for pinyon and 104 trees/acre for juniper. Average diameter of juniper was 3.8 inches while that of pinyon was 2.3 inches. The study is located at an elevation of about 7,000 feet on a moderately sloping (5-8%) hillside facing south into a dry wash and an untreated pinyon-juniper woodland type.

The soil is a very rocky, sandy clay loam with rocks on the surface ranging in size from small to good sized boulders that have been left on the surface from past erosion. The soil appears to be moderately shallow (effective rooting depth of less than 10 inches) as manifested by the dominance of the shallow-rooted species, black sagebrush. There are some areas showing some compaction and some soil loss on cattle trails, but overall there appears to be little current erosion. The site has a mildly alkaline soil (7.5 pH). Soil phosphorus could be a limiting factor with 7.5 ppm, where 10 ppm is considered necessary for normal plant development. Percent organic matter is average for sites in this area. Soil temperature could also be another limiting factor with a temperature of 65°F at about 10 inches. Winter annuals could be quite successful on this type of site with these warm soil temperatures.

Black sagebrush makes up 57% of the browse cover. The moderately dense, mostly mature population (74%) exhibits little sign of over utilization; although some are moderately hedged. Young plants have made up from 7% to 17% of the population in the past, now they represent 8% of the population. In the past, some of the mature plants showed signs of reduced vigor by the presence of chlorotic leaves, with the percentage of the population showing decadence being relatively stable (8-9%). Percent decadence has gone up to 18% in 1999. The biotic potential (proportion of seedlings to the population) has gone from 6% (1994) to zero (1999). The population has decreased from 2,720 plants/acre (1994) to currently where it is down to 2,020 plants/acre. Other desirable browse plants are limited to a few bitterbrush, green ephedra, and fourwing saltbush. The pinyon pine and juniper are becoming more dominant on the chaining where many plants are at the height of 8-10 feet.

The seeded wheatgrasses were more prevalent in the past, where now they only provide about one-fifth of the grass cover. They have all decreased nested frequency values, likely due to the extended drought coupled with spring livestock grazing. Cheatgrass contributed 74% of the grass cover in 1994. Currently, this value has decreased to 59%, however the sum of nested values indicate it has increased in abundance. Cover has decreased because of the drought. Perennial forb density and diversity is low. Eighteen species have been encountered through the years, but only eleven were sampled in 1999. Almost half of these were annuals. The only forb species found with fair cover in 1994 was rock goldenrod, thickleaf peavine, and timber poisonvetch. Currently, only rock goldenrod has fair cover. This one species makes up 68% of the total forb cover.

The prevalence of rocks on the surface accounts for the estimated 22% rock and pavement cover. The value has increased in 1999 to 26%. This value has been steadily increasing since 1987. The percentage of vegetative cover is fairly good. Litter cover, although there is abundant debris from the chaining, is composed mostly of cheatgrass and has decreased from 62% down to 42%. However, percent bare ground is only at 12% for 1994 and 1999.

1994 TREND ASSESSMENT

The soil trend is stable to slightly improved. There has been some loss of the liter cover, which would be expected with the extended drought, but percent bare ground has decreased to only 12%. The browse trend is stable to improving with an increased biotic potential and stable rate of decadence. There was a slight increase in those considered in poor vigor, but this will turn around with more normal precipitation patterns. The increase in the number of broom snakeweed found on the site is likely due to the larger sample size taken in 1994 which better estimates plants with a clumped or discontinuous distribution. The trend for the herbaceous understory is down, as the perennial grass species have greatly decreased nested frequency values and the perennial forb species have increased slightly, but they have cover values half that of the grasses.

TREND ASSESSMENT
soil - stable to slightly improved
browse - stable to improving
herbaceous understory - down with the extended drought

1999 TREND ASSESSMENT

The soil trend is considered stable. There has been some loss in litter cover since 1987, but it has been stable between 1994 and 1999. Percent bare soil has also remained about the same. The browse trend for the key species (black sagebrush) is down. In 1994, it provided 57% of the browse cover, now it has gone done to only 39%. Conversely, cover for pinyon and juniper has increased from 34% of the browse cover to now where it provides 57% of the cover. There were no dead plants noted in 1994, now the ratio of dead to live is 1:7 (13% dead). Percent decadence has also increased from 8% to 18%. All this change has occurred with mostly light to moderate use. The long-term drought and associated winter injury, coupled with shallow soils and moderately high soil temperatures have caused significant losses to this population. There was a slight increase in those considered in poor vigor, but this should turn around with more normal precipitation patterns. The increase in the number of broom snakeweed found on the site has actually decreased. The trend for the herbaceous understory is slightly down for the perennial grasses and forbs. The annual component of the herbaceous species fluctuated, however, one thing that is constant is that cheatgrass is increasing.

TREND ASSESSMENT
soil - stable
browse - down
herbaceous understory - continued down for perennial species with the extended drought

HERBACEOUS TRENDS --
Herd unit 13A, Study no: 5

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
G	Agropyron cristatum	94	65	83	39	25	36	2.66	3.08
G	Agropyron intermedium	b137	a48	a49	53	21	19	1.01	1.23
G	Bromus anomalus	b31	ab7	a-	16	2	-	.15	-
G	Bromus japonicus (a)	-	-	2	-	-	2	-	.01
G	Bromus tectorum (a)	-	317	333	-	94	98	16.43	9.10
G	Hilaria jamesii	a-	b13	b22	-	6	7	.13	.66
G	Oryzopsis hymenoides	56	30	24	22	14	14	1.12	.79

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	‰94	‰99
G	Poa fendleriana	36	26	19	17	13	9	.43	.24
G	Sitanion hystrix	$_{b}$64	$_{a}$33	$_{a}$16	28	17	7	.14	.17
Total for Annual Grasses		0	317	335	0	94	100	16.43	9.11
Total for Perennial Grasses		418	222	213	175	98	92	5.66	6.18
Total for Grasses		418	539	548	175	192	192	22.09	15.30
F	Arabis perennans	$_{b}$12	$_{ab}$6	$_{a}$-	7	2	-	.01	-
F	Astragalus convallarius	$_{a}$-	$_{b}$10	$_{b}$15	-	7	9	1.54	.43
F	Astragalus coltoni	2	3	2	1	2	2	.03	.01
F	Castilleja linariaefolia	-	3	-	-	2	-	.01	-
F	Cryptantha humilis	-	-	-	-	-	-	.00	-
F	Cymopterus spp.	-	-	1	-	-	1	-	.03
F	Descurainia pinnata (a)	-	5	2	-	2	1	.01	.00
F	Draba reptans (a)	-	$_{b}$61	$_{a}$3	-	29	2	.15	.03
F	Erigeron pumilus	3	-	-	1	-	-	-	-
F	Gilia spp. (a)	-	$_{b}$36	$_{a}$5	-	17	3	.08	.01
F	Lathyrus lanszwertii	$_{a}$2	$_{b}$81	$_{b}$56	1	37	28	2.56	.74
F	Lesquerella spp.	-	1	6	-	1	2	.00	.01
F	Machaeranthera canescens	5	3	-	2	1	-	.00	-
F	Microsteris gracilis (a)	-	$_{b}$46	$_{a}$5	-	24	3	.12	.01
F	Petradoria pumila	$_{a}$34	$_{b}$75	$_{b}$62	14	30	25	4.05	2.96
F	Phlox longifolia	$_{a}$-	$_{b}$7	$_{a}$-	-	4	-	.02	-
F	Ranunculus testiculatus (a)	-	$_{b}$6	$_{a}$-	-	3	-	.04	-
F	Sphaeralcea coccinea	$_{a}$-	$_{ab}$6	$_{b}$8	-	2	4	.41	.07
Total for Annual Forbs		0	154	15	0	75	9	0.40	0.07
Total for Perennial Forbs		58	195	150	26	88	71	8.67	4.26
Total for Forbs		58	349	165	26	163	80	9.07	4.33

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 13A, Study no: 5

Type	Species	Strip Frequency '94	Strip Frequency '99	Average Cover % '94	Average Cover % '99
B	Artemisia nova	48	47	10.10	7.46
B	Artemisia tridentata wyomingensis	0	1	-	-
B	Atriplex canescens	3	3	1.00	.76
B	Coryphantha vivipara arizonica	0	2	-	-
B	Ephedra viridis	3	2	-	-
B	Gutierrezia sarothrae	12	13	.50	.03
B	Juniperus osteosperma	0	11	4.92	7.59
B	Opuntia erinacea	1	0	.00	-
B	Pediocactus simpsonii	0	1	-	-
B	Pinus edulis	0	6	1.18	3.32
B	Yucca baccata baccata	0	0	-	-
Total for Browse		67	86	17.71	19.16

CANOPY COVER --
Herd unit 13A, Study no: 5

Species	Percent Cover '99
Juniperus osteosperma	1

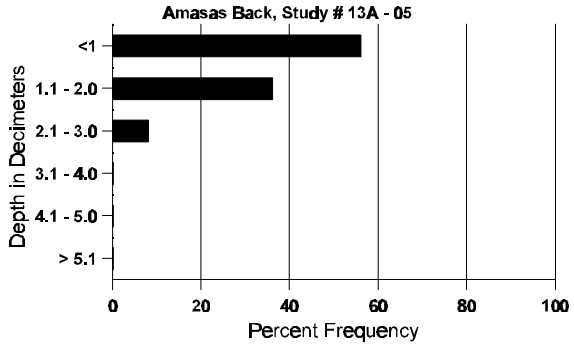
BASIC COVER --
Herd unit 13A, Study no: 5

Cover Type	Nested Frequency '94	Nested Frequency '99	Average Cover % '87	Average Cover % '94	Average Cover % '99
Vegetation	343	354	4.75	41.08	37.70
Rock	278	263	17.50	19.76	20.53
Pavement	201	201	1.25	1.53	5.09
Litter	377	371	61.50	42.43	42.45
Cryptogams	39	71	.50	.58	1.34
Bare Ground	225	230	14.50	12.41	12.25

SOIL ANALYSIS DATA --
Herd Unit 13A, Study # 05, Study Name: Amasas Back

Effective rooting depth (cm)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
9.7	65.0 (10.6)	7.5	50.9	19.8	29.3	3.5	7.5	96.0	0.6

Stoniness Index



PELLET GROUP DATA --
Herd unit 13A, Study no: 5

Type	Quadrat Frequency '94	Quadrat Frequency '99	Pellet Transect Days Use/Acre (ha) '99
Rabbit	9	20	N/A
Elk	7	20	54 (133)
Deer	13	23	34 (84)

BROWSE CHARACTERISTICS --
Herd unit 13A, Study no: 5

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia nova																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	8	-	-	-	-	-	-	-	-	8	-	-	-	160			8
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	9	3	-	-	-	-	-	-	-	10	1	1	-	400			12
	94	9	1	-	-	-	-	-	-	-	6	-	4	-	200			10
	99	5	3	-	-	-	-	-	-	-	7	-	1	-	160			8
M	87	38	12	1	1	-	-	-	-	-	44	2	6	-	1733	12	16	52
	94	87	25	-	3	-	-	-	-	-	93	-	22	-	2300	18	31	115
	99	44	25	5	1	-	-	-	-	-	75	-	-	-	1500	17	27	75
D	87	2	4	-	-	-	-	-	-	-	6	-	-	-	200			6
	94	5	2	2	-	2	-	-	-	-	6	-	3	2	220			11
	99	12	3	1	2	-	-	-	-	-	13	-	-	5	360			18
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	280			14

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	27%	01%	10%	+14%
'94	22%	01%	23%	-26%
'99	31%	06%	06%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:
	'87	2333	9%
	'94	2720	8%
	'99	2020	18%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	34	56	0
	99	-	2	-	-	-	-	-	-	-	2	-	-	-	40	30	34	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	100%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	40		-

Atriplex canescens																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	1	1	-	-	-	-	-	-	2	-	-	-	40			2
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	3	-	-	-	-	-	-	-	-	3	-	-	-	60	36	44	3
	99	-	2	-	-	-	-	-	-	-	2	-	-	-	40	34	40	2
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	1	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	60%	40%	00%

%Change

+20%

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	0%
	'94	80		0%
	'99	100		20%

Coryphantha vivipara arizonica																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	3	8	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	40		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Ephedra viridis																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	4	-	-	-	-	-	-	4	-	-	-	80	11	6	4
	99	1	-	1	-	-	-	-	-	-	2	-	-	-	40	19	23	2
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	100			5
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	80%	00%	-60%
'99	00%	50%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	100		-
	'99	40		-

Gutierrezia sarothrae																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
	99	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	21	-	-	-	-	-	-	-	-	21	-	-	-	420	8	11	21
	99	17	-	-	-	-	-	-	-	-	17	-	-	-	340	8	11	17
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	6	-	-	-	-	-	-	-	-	5	-	-	1	120			6
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	100			5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	03%	-36%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	0%
	'94	660		18%
	'99	420		0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	87	3	-	-	-	-	-	-	-	-	3	-	-	-	100	46	31	3
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	7	-	-	-	-	-	-	1	-	8	-	-	-	160	-	-	8
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	100	Dec:	-
	'94	0		-
	'99	220		-

Opuntia erinacea																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	1	-	-	-	-	-	-	-	-	-	-	1	-	20	2	4	1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	5	15	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	100%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	20		-
	'99	0		-

Pediocactus simpsonii																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	1	-	-	-	-	-	1	-	-	-	20	1	3	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	40		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pinus edulis																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	3	-	-	-	-	-	4	-	-	-	80	-	-	4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	120		-

Purshia tridentata																		
M	87	-	1	-	-	-	-	-	-	-	1	-	-	-	33	5	11	1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	16	29	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	19	43	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	100%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	33	Dec:	-
	'94	0		-
	'99	0		-

Yucca baccata baccata																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4	8	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	0		-

Trend Study 13A-6-99

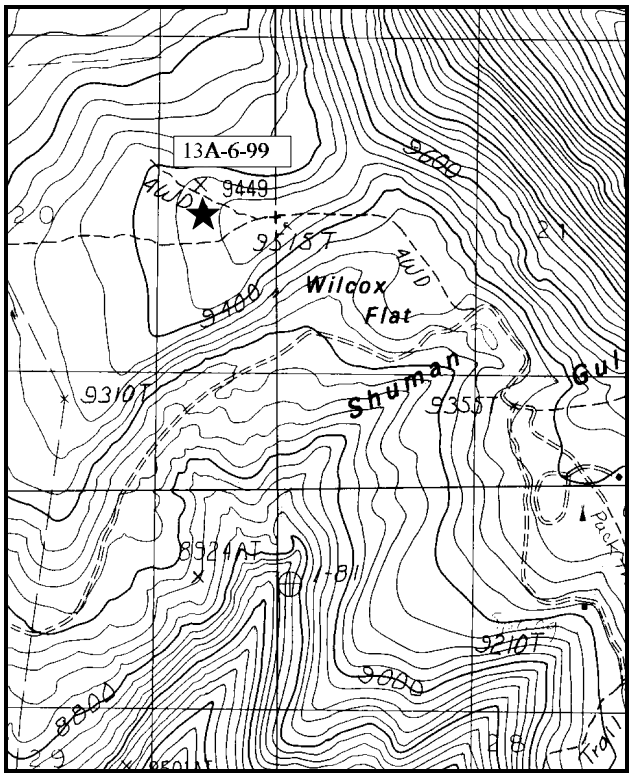
Study site name: Bald Mesa . Range type: Snowberry .

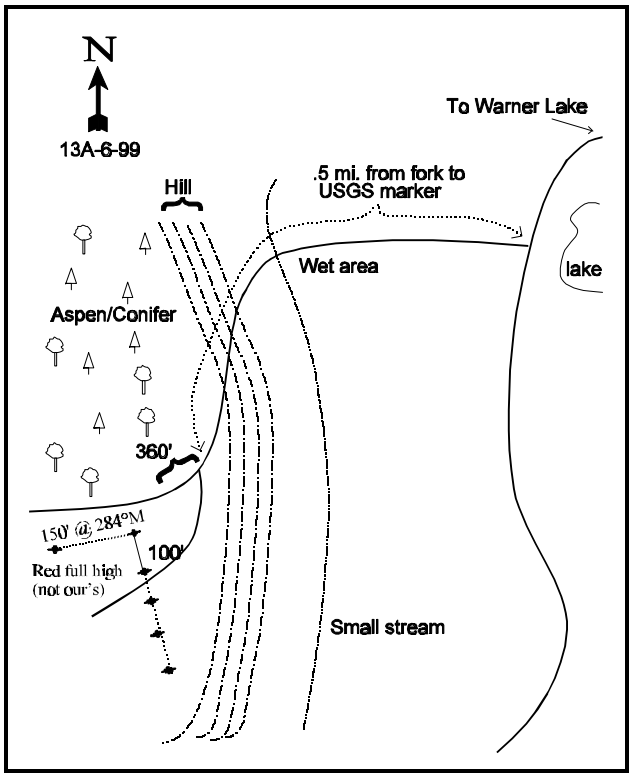
Compass bearing: frequency baseline 185°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the LaSal Mountain Loop Road, take the Warner Lake Campground road 4.8 miles. Turn left onto a minor road which crosses Wilcox Flat, then turns into a rough, rutted road going up the side of the hill to Bald Mesa. Walk or drive 0.5 miles up this road, continuing past the aspen-conifer edge to a fork in the meadow. Follow the right fork 200 feet to the first baseline stake, located 10 feet off the road to the left. The transect is marked by 12" fence posts.





Map Name: Warner Lake Diagrammatic Sketch

Township 26S , Range 24E , Section 20 UTM 4265472.838 N, 649258.710 E

DISCUSSION

Trend Study No. 13A-6 (33-6)

Bald Mesa is just west of the high LaSal peaks. This trend study samples a typical high elevation mesa that supports a mountain brush-forb-grass vegetation type. This type occupies only a small percentage of the high country. Here, it is bounded to the north and east by aspen and conifer forests. The area is used mostly as summer range for cattle with some big game use. 1999 pellet group transect data estimates 9 elk days use/acre (22 edu/ha) and 84 cow days use/acre (207 cdu/ha).

The fairly level mesa has a southwest aspect on a gentle 2% slope and an elevation of 9,400 feet. It is a productive site, rich in species and should receive annual precipitation in excess of 20 inches. The clay loam soil is slightly acidic (6.2 pH) and gravelly with scattered rock on the surface. Effective rooting depth is 15 inches. Phosphorus could be a limiting factor on this site at 6.1 ppm, where 10 ppm is considered minimal for normal plant development. No significant erosion has occurred on the site, although the access roads (which have now been closed) are washed out and severely eroded.

Snowberry forms the dominant shrub cover on this open site which comprises 67% of the shrub cover for 1994 and 1999. The plants are vigorous with mostly light use, but some showing moderate use. The mountain big sagebrush on the site has shown significant changes in it's population, however this has been because of the problem with classifying whether is was mountain big sagebrush or black sagebrush. The combined sagebrush population for 1994 and 1999 is 620 plants/acre for both years, with over 90% being classified as black sagebrush in 1999. The decrease in the mountain big sagebrush density is mostly because some of these individuals were reclassified as black sagebrush during the 1994 reading, and more so in the 1999 reading. Because of the elevation and not generally used as a winter range, browse is not critical for this site. Also, the browse only makes up approximately 25% of the total vegetative cover. Other browse species found on the site include currant (*Ribes sp.*), low rabbitbrush, and Wood's rose.

Herbaceous vegetation forms a diverse and dense understory. Forbs are abundant with them providing almost 49% (1994) and 40% (1999) of the total vegetative cover. These species provide valuable summer forage. More than 30 forb species have been encountered on the site in 1994 and 1999, with 8 of the most common forb species providing 80% of the total forb cover. Grasses are also quite dense providing on average about 28% of the total vegetative cover. Kentucky bluegrass makes up the bulk of the grass cover, on average contributing 85% of it. The majority of the herbaceous species on this site are increasers with heavy grazing. The dense herbaceous understory accounts for a high amount of the vegetative cover (on average, 73% of the total vegetative cover). Litter cover decreased slightly in 1994, but since then it has increased by almost 30% in 1999.

1994 TREND ASSESSMENT

The soil trend is stable with percent bare ground at only 6%. Percent litter cover has decreased somewhat, but this has occurred on all sites with the extended drought conditions and will turn around with more normal precipitation patterns. The browse trend is mixed, for most all species it is stable except for mountain big sagebrush which has some downward population trends, but it only contributes 5% of the browse cover or 1% of the total vegetative cover. Another important consideration is that browse would not be a "key" species for this summer range. Trend for browse would therefore be considered stable. Trend for the herbaceous understory is slightly down with nested frequency values for grasses and forbs falling since 1987. This downward trend has most likely been caused by the long term drought we have been experiencing since 1985.

TREND ASSESSMENT
soil - stable
browse - stable
herbaceous understory - slightly down, but still in very good condition

1999 TREND ASSESSMENT

The soil trend is stable with percent bare ground down to only 5%. Percent litter cover has increased from 40% to 55%. The browse trend is mixed, but on average it only contributes 27% of the total vegetative cover. Another important consideration is that browse would not be a "key" species for this summer range. Trend for browse would therefore be considered stable. Trend for the herbaceous understory is down with lower nested frequency values. They are slightly down for grasses and substantially down for forbs which make up 55% of the herbaceous cover. This downward trend has mostly been caused by the many years of drought we have been experiencing since 1985.

TREND ASSESSMENT
soil - stable
browse - stable
herbaceous understory - slightly down, but still in very good condition

HERBACEOUS TRENDS --
Herd unit 13A, Study no: 6

Type	Species	Nested Frequency '87	'94	'99	Quadrat Frequency '87	'94	'99	Average Cover % '94	'99
G	Agropyron spp.	$_{b}$128	$_{a}$-	$_{a}$1	54	-	1	-	.01
G	Bromus anomalus	$_{ab}$1	$_{b}$5	$_{a}$-	1	3	-	.04	-
G	Carex spp.	4	-	5	2	-	2	-	.03
G	Dactylis glomerata	-	-	5	-	-	2	-	.04
G	Koeleria cristata	$_{a}$-	$_{b}$35	$_{b}$27	-	15	12	.36	.21
G	Phleum pratense	-	-	5	-	-	2	-	.15
G	Poa arida	$_{b}$136	$_{a}$28	$_{a}$17	41	11	6	.54	1.07
G	Poa fendleriana	-	-	3	-	-	1	-	.03
G	Poa pratensis	$_{a}$257	$_{b}$332	$_{b}$346	78	94	96	12.42	22.36
G	Sitanion hystrix	$_{a}$34	$_{b}$57	$_{ab}$45	14	31	19	.80	.72
G	Stipa comata	$_{b}$99	$_{a}$49	$_{a}$32	43	24	13	1.14	.68
G	Stipa lettermani	$_{a}$-	$_{b}$59	$_{b}$48	-	31	21	1.08	1.42
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		659	565	534	233	209	175	16.42	26.75
Total for Grasses		659	565	534	233	209	175	16.42	26.75
F	Achillea millefolium	102	125	110	37	45	44	2.53	2.02
F	Agoseris glauca	$_{a}$-	$_{b}$14	$_{b}$19	-	6	9	.08	.12
F	Androsace septentrionalis (a)	$_{b}$16	$_{a}$-	$_{a}$-	8	-	-	-	-
F	Arenaria congesta	$_{a}$181	$_{b}$240	$_{a}$195	66	76	73	8.03	5.33
F	Arabis drummondi	$_{b}$38	$_{a}$-	$_{a}$-	18	-	-	-	-
F	Aster chilensis	$_{a}$-	$_{b}$50	$_{a}$-	-	17	-	.89	-
F	Astragalus miser	$_{c}$226	$_{b}$191	$_{a}$72	78	72	30	7.73	3.42
F	Astragalus spp.	$_{a}$-	$_{a}$-	$_{b}$179	-	-	69	-	7.96

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
F	Castilleja linariaefolia	$_{a}$-	$_{b}$19	$_{b}$15	-	9	7	.26	.30
F	Calochortus nuttallii	$_{a}$-	$_{ab}$3	$_{b}$13	-	2	7	.01	.08
F	Chenopodium album (a)	-	-	1	-	-	1	-	.00
F	Cirsium calcareum	$_{a}$51	$_{b}$108	$_{a}$52	27	49	23	1.19	1.97
F	Clematis hirsutissima	$_{b}$13	$_{a}$-	$_{a}$-	6	-	-	-	-
F	Comandra pallida	28	21	31	11	8	11	.33	.78
F	Collinsia parviflora (a)	-	-	1	-	-	1	-	.00
F	Crepis acuminata	15	18	18	6	6	8	.16	.45
F	Delphinium nuttallianum	$_{c}$75	$_{b}$8	$_{a}$-	39	6	-	.08	-
F	Erigeron flagellaris	88	52	29	37	21	12	.33	.21
F	Eriogonum racemosum	61	65	56	31	31	29	1.35	.84
F	Erigeron speciosus	$_{a}$39	$_{b}$65	$_{a}$15	15	28	6	1.98	.27
F	Eriogonum umbellatum	12	6	2	6	2	1	.01	.15
F	Galium boreale	-	5	4	-	2	2	.53	.41
F	Holosteum umbellatum (a)	-	-	5	-	-	2	-	.01
F	Ipomopsis aggregata	2	3	3	1	1	1	.00	.00
F	Lathyrus brachycalyx	-	-	-	-	-	-	-	.53
F	Lomatium dissectum	-	3	1	-	1	1	.00	.38
F	Lupinus sericeus	$_{b}$117	$_{a}$57	$_{a}$41	50	24	20	3.16	2.66
F	Lychnis drummondii	-	-	2	-	-	2	-	.01
F	Mertensia brevistyla	$_{b}$8	$_{ab}$3	$_{a}$-	5	1	-	.00	-
F	Penstemon palmeri	$_{b}$49	$_{a}$4	$_{a}$4	23	2	2	.15	.03
F	Petradoria pumila	$_{a}$-	$_{b}$26	$_{b}$31	-	10	14	.92	.51
F	Penstemon strictus	$_{a}$-	$_{b}$32	$_{b}$31	-	17	11	.52	.61
F	Penstemon thompsoniae	$_{a}$-	$_{ab}$2	$_{b}$6	-	1	3	.03	.06
F	Phlox spp.	-	3	3	-	1	1	.15	.03
F	Potentilla anersina	64	95	78	27	40	35	2.24	1.72
F	Polygonum douglasii (a)	-	$_{a}$1	$_{b}$15	-	1	6	.00	.03
F	Senecio integerrimus	$_{c}$197	$_{b}$84	$_{a}$29	78	31	13	1.18	.29
F	Sedum lanceolatum	$_{b}$22	$_{ab}$1	$_{a}$-	9	1	-	.00	-
F	Taraxacum officinale	$_{b}$172	$_{a}$66	$_{a}$65	76	26	29	.39	1.35
F	Thalictrum fendleri	-	-	3	-	-	1	-	.30
F	Trifolium spp.	1	-	3	1	-	1	-	.00
F	Unknown forb-perennial	$_{b}$34	$_{a}$-	$_{a}$-	19	-	-	-	-
F	Zigadenus paniculatus	2	-	-	2	-	-	-	-
Total for Annual Forbs		16	1	22	8	1	10	0.00	0.05
Total for Perennial Forbs		1597	1369	1110	668	543	465	34.35	32.89
Total for Forbs		1613	1370	1132	676	544	475	34.36	32.94

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 13A, Study no: 6

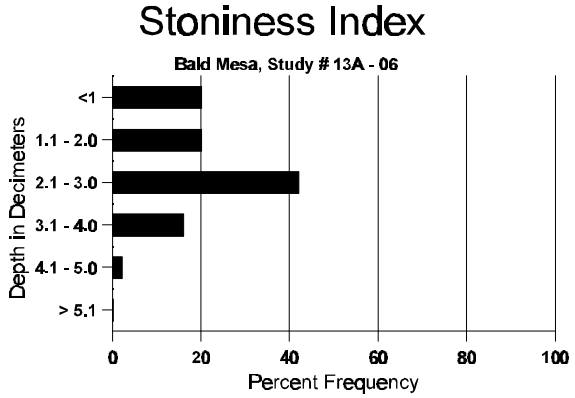
Type	Species	Strip Frequency '94	Strip Frequency '99	Average Cover % '94	Average Cover % '99
B	Artemisia tridentata vaseyana	19	22	1.96	1.57
B	Chrysothamnus viscidiflorus lanceolatus	41	34	1.79	2.50
B	Chrysothamnus viscidiflorus stenophyllus	0	0	-	-
B	Clematis spp.			-	.15
B	Ribes spp.	4	0	2.62	-
B	Ribes cereum cereum	0	3	-	1.33
B	Ribes montigenum	0	3	-	1.26
B	Rosa woodsii	1	1	.15	.00
B	Sambucus racemosa	1	3	.03	-
B	Symphoricarpos oreophilus	46	49	13.17	14.17
Total for Browse		112	115	19.72	21.01

BASIC COVER --
Herd unit 13A, Study no: 6

Cover Type	Nested Frequency '94	Nested Frequency '99	Average Cover % '87	Average Cover % '94	Average Cover % '99
Vegetation	392	390	26.00	66.22	70.77
Rock	145	68	2.75	1.59	1.36
Pavement	91	99	0	.20	1.12
Litter	364	348	64.00	39.64	54.87
Cryptogams	21	5	.50	.12	.06
Bare Ground	212	145	6.75	6.11	5.03

SOIL ANALYSIS DATA --
Herd Unit 13A, Study # 06, Study Name: Bald Mesa

Effective rooting depth (cm)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
15.0	49.6 (16.3)	6.2	40.2	32.6	27.3	5.0	6.1	2620.4	0.4



PELLET GROUP DATA --
Herd unit 13A, Study no: 6

Type	Quadrat Frequency '94	Quadrat Frequency '99	Pellet Transect Days Use/Acre (ha) '99
Elk	4	3	9 (22)
Deer	-	1	0
Cattle	4	17	84 (207)

BROWSE CHARACTERISTICS --
Herd unit 13A, Study no: 6

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
	99	4	4	1	-	-	-	-	-	-	9	-	-	-	180			9
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	99	-	8	-	-	-	-	-	-	-	8	-	-	-	160			8
M	87	2	3	1	-	-	-	-	-	-	4	-	2	-	400	15	25	6
	94	15	3	-	-	-	-	-	-	-	18	-	-	-	360	16	20	18
	99	5	7	-	2	-	-	1	-	-	15	-	-	-	300	14	21	15
D	87	3	2	3	-	-	-	-	-	-	6	-	2	-	533			8
	94	10	-	-	-	-	-	-	-	-	7	-	-	3	200			10
	99	5	3	-	-	-	-	-	-	-	8	-	-	-	160			8
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	260			13
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	420			21

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	36%	29%	29%	-34%
'94	10%	00%	10%	+ 0%
'99	58%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	933	Dec:	57%
	'94	620		32%
	'99	620		26%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus lanceolatus																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	61	-	-	-	-	-	-	-	-	61	-	-	-	1220	14	18	61
	99	45	2	-	3	-	-	-	-	-	50	-	-	-	1000	14	18	50
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	-21%
'99	04%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	1340		-
	'99	1060		-

Chrysothamnus viscidiflorus stenophyllus																		
S	87	-	2	-	-	-	-	-	-	-	2	-	-	-	133			2
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	9	10	1	-	-	-	-	-	-	20	-	-	-	1333			20
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	10	7	1	-	-	-	-	-	-	18	-	-	-	1200	13	21	18
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
D	87	2	3	2	-	-	-	-	-	-	7	-	-	-	466			7
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	44%	09%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	2999	Dec:	16%
	'94	0		0%
	'99	0		0%

Ribes spp.																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	3	-	-	6	-	-	-	-	-	9	-	-	-	180	49	93	9
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	180		-
	'99	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Ribes cereum cereum																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	-	-	-	2	-	-	3	-	-	-	60	65	90	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:		-
'94	0			-
'99	60			-

Ribes montigenum																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	3	-	-	3	-	-	-	60	34	37	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:		-
'94	0			-
'99	60			-

Rosa woodsii																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20	12	19	1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	+ 0%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:		-
'94	20			-
'99	20			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Sambucus racemosa																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	1	-	-	1	-	-	-	20			1
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	3	-	-	-	-	-	3	-	-	-	60	29	40	3
	99	-	-	-	1	-	-	1	-	-	2	-	-	-	40	35	39	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	+ 0%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:		-
'94	60			-
'99	60			-

Symphoricarpos oreophilus																		
S	87	28	-	-	-	-	-	-	-	-	28	-	-	-	1866			28
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
Y	87	43	9	-	-	-	-	-	-	-	52	-	-	-	3466			52
	94	9	-	-	-	-	-	-	-	-	9	-	-	-	180			9
	99	4	-	-	-	-	-	1	-	-	5	-	-	-	100			5
M	87	6	9	1	-	-	-	-	-	-	16	-	-	-	1066	25	23	16
	94	94	-	-	2	-	-	-	-	-	96	-	-	-	1920	22	50	96
	99	40	9	1	3	-	-	4	-	-	57	-	-	-	1140	25	42	57
D	87	-	4	-	-	-	-	-	-	-	4	-	-	-	266			4
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	3	-	-	3	-	-	2	-	-	8	-	-	-	160			8
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	31%	01%	00%	-56%
'94	00%	00%	00%	-33%
'99	13%	01%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	4798	Dec:		6%
'94	2100			0%
'99	1400			11%

Trend Study 13A-7-99

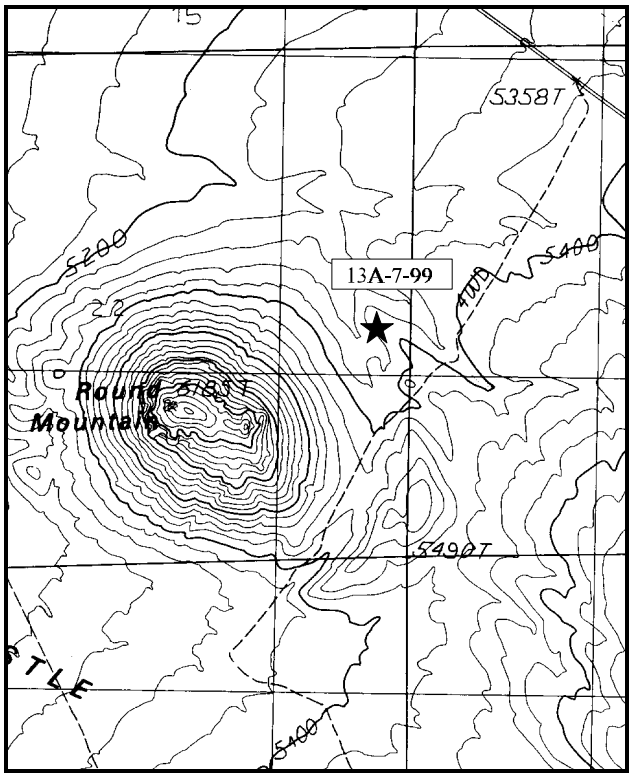
Study site name: Round Mountain . Range type: Blackbrush .

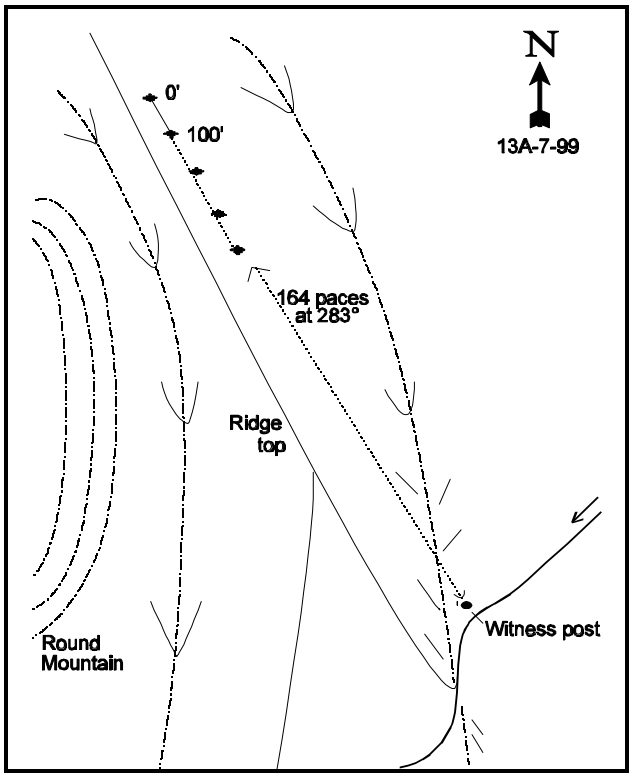
Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Travel 6.8 miles up the Castle Valley Road (LaSal Mountain Loop Road) from SR 128 along the Colorado River. Turn onto a rough dirt road heading south towards Round Mountain. Travel 0.55 miles to just before the road drops into a deep draw. There is a witness post (4' green fencepost) on the right side of the road. From here, walk 164 paces west northwest (approximately 283°) down and across the draw to the top of a sage-blackbrush ridge. The 0-foot baseline stake is a short fencepost marked with a red browse tag #7837.





Map Name: Warner Lake Diagrammatic Sketch

Township 25S , Range 23E , Section 22 UTM 4275165.472 N, 643305.147 E

DISCUSSION

Trend Study No. 13A-7 (33-7)

The Round Mountain study samples a blackbrush-sagebrush type near the center of Castle Valley, just east of Round Mountain, a prominent landmark. Castle Valley, on the northeast end of the LaSal Mountain range, is considered critical winter range for deer. Pellet group transects on the study area indicated use to be 2 elk days use/acre (5 edu/ha) and 78 deer days use/acre (193 ddu/ha). Much of the land in lower Castle Valley is managed by the Utah Division of State Lands and Forestry which allows winter use by cattle on this key wintering area. The study is located on a small ridge within the rolling foothills below Round Mountain. The elevation is 5,400 feet with a generally western exposure. Drainage of the area is northwest through Castle Valley to the Colorado River.

The soil is very rocky, both on the surface and below. It is a moderately shallow, reddish sandy clay loam soil with an effective rooting depth of about 10 inches. It is mildly to moderately alkaline with a pH of 7.8. The most obvious limiting feature of the site is that the soil temperature at 10 inches is almost 70°F. This temperature would make it advantageous for annuals to dominate the herbaceous understory. Although it appears to be highly erodible, there is little evidence of current erosion. However, erosion has historically been a problem with large amounts of rock cover present. Current rock-pavement totals are quite high at almost 50%.

Shrubs provide the only forage available to deer in the winter. The key species, but not the most dominant, is Wyoming big sagebrush. The shallow-soiled ridge tops also support good populations of blackbrush. Wyoming big sagebrush made up 34% of the browse cover in 1994, now it only makes up 13% of the browse cover. The blackbrush, which is more adapted to the high soil temperatures and drought, made up 46% of the browse cover in 1994, now it makes up 52% of the browse cover. Together on average, these two species contribute 57% of the total vegetative cover. However, total vegetative cover is less than 30%. Density plot information on sagebrush in 1987 appeared to indicate a stable population even when the plants showed heavy browsing use (64% of them at that time). In 1994, only 3% showed heavy use, now 56% show heavy use. Percent decadence has been above 50% since 1994. Since 1994, more than 40% of the decadent plants have been classified as dying. This population is not displaying traits of a stable population. From 1994 to 1999, the population has decreased by 26%. With a reproductive potential of zero and the percent young age class at only 1%, there are no replacements coming in the near future. The blackbrush show moderate to heavy use. Their population has also declined by 15% since 1994. This is a much better trend than that for Wyoming big sagebrush which obviously was more effected by the extended drought and high soil temperatures than the blackbrush. However, the trend for browse on this site is still down. Juniper and a few pinyon trees are found in the washes and slopes of Round Mountain.

Herbaceous vegetation (grasses and forbs) are not an important component of this community for on average they only make up 22% of the total vegetative cover. Over 96% of the grass cover is contributed by annual grasses, mostly cheatgrass. Perennial grasses are few. Mutton bluegrass is found mostly growing in the protection of shrub crowns. Total forb cover in 1999 was less than 1%. There were 14 species of forbs found in 1994, now only 8 can be found, of which only 3 species are perennial.

The rocky nature of the site explains why there is almost 50% cover for rock and pavement. Percent bare ground was fairly low, but only because of the high cover value for rock and pavement. The proportion of the plant cover provided by the herbaceous understory is very low leaving the soil unprotected from high intensity summer storms.

1994 TREND ASSESSMENT

The trend for soils would be slightly down because of the loss of much of the litter cover down to only 20% and percent bare ground has increased to 24%. The browse trend is down for Wyoming big sagebrush which

is the primary key species for this site. More than 25% of the population is dead, a ratio of almost one in three plants. Biotic potential is zero, and the percentage of young plants has gone from 44% to only 3%. The trend for the herbaceous understory shows increased nested frequency values, but over 90% of the cover is contributed by annual species. Trend is down for the herbaceous understory.

TREND ASSESSMENT
soil - slightly down
browse - down
herbaceous understory - down

1999 TREND ASSESSMENT

The trend for soils would be slightly down because of continuing increase in percent rock cover. The browse trend is down for both Wyoming big sagebrush and blackbrush which are the primary key species for this site. There have been losses in the population for both sagebrush and blackbrush, 26% and 15% respectively. More than one-third of the sagebrush population is dead. Biotic potential is zero, and the percentage of young plants is only 1%. The trend for the herbaceous understory shows increased nested frequency values, but over 90% of the cover is contributed by annual species. Trend is also down for the herbaceous understory.

TREND ASSESSMENT
soil - slightly down
browse - down
herbaceous understory - down

HERBACEOUS TRENDS --
Herd unit 13A, Study no: 7

Type	Species	Nested Frequency '87	'94	'99	Quadrat Frequency '87	'94	'99	Average Cover % '94	'99
G	Bromus tectorum (a)	-	$_{a}$214	$_{b}$327	-	72	96	3.00	6.42
G	Poa fendleriana	-	3	4	-	3	3	.01	.04
G	Sitanion hystrix	-	$_{b}$4	$_{a}$-	-	3	-	.04	-
G	Vulpia octoflora (a)	-	$_{b}$145	$_{a}$75	-	54	30	.32	.22
Total for Annual Grasses		0	359	402	0	126	126	3.31	6.65
Total for Perennial Grasses		0	7	4	0	6	3	0.05	0.04
Total for Grasses		0	366	406	0	132	129	3.37	6.69
F	Arabis spp.	14	3	1	6	2	1	.01	.00
F	Astragalus moencopensis	-	1	-	-	1	-	.00	-
F	Astragalus spp.	$_{a}$6	$_{b}$71	$_{a}$10	3	34	6	.17	.03
F	Castilleja chromosa	-	2	-	-	1	-	.01	-
F	Descurainia pinnata (a)	-	$_{b}$25	$_{a}$-	-	10	-	.05	-
F	Draba reptans (a)	-	$_{b}$190	$_{a}$10	-	80	5	.42	.02
F	Eriogonum cernuum (a)	-	2	-	-	1	-	.00	-
F	Erigeron pumilus	1	-	-	1	-	-	-	-
F	Gilia spp. (a)	-	$_{b}$106	$_{a}$10	-	40	5	.20	.05

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
F	Holosteum umbellatum (a)	-	$_{a}$-	$_{b}$11	-	-	4	-	.02
F	Lappula occidentalis (a)	-	$_{b}$11	$_{a}$-	-	5	-	.02	-
F	Penstemon pachyphyllus	3	-	-	1	-	-	-	-
F	Physaria spp.	-	4	-	-	2	-	.03	-
F	Plantago patagonica (a)	-	$_{b}$20	$_{a}$11	-	9	4	.04	.02
F	Senecio multilobatus	-	20	8	-	10	5	.67	.05
F	Sisymbrium altissimum (a)	-	9	3	-	4	2	.02	.01
F	Streptanthus cordatus	-	15	-	-	7	-	.43	-
Total for Annual Forbs		0	363	45	0	149	20	0.77	0.12
Total for Perennial Forbs		24	116	19	11	57	12	1.34	0.08
Total for Forbs		24	479	64	11	206	32	2.11	0.21

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 13A, Study no: 7

Type	Species	Strip Frequency		Average Cover %	
		'94	'99	'94	'99
B	Artemisia tridentata vaseyana	0	2	-	-
B	Artemisia tridentata wyomingensis	68	50	7.01	3.01
B	Atriplex canescens	0	0	-	-
B	Coleogyne ramosissima	64	65	9.59	11.75
B	Ephedra viridis	2	1	.03	.15
B	Gutierrezia sarothrae	50	57	.95	1.16
B	Juniperus osteosperma	0	3	3.08	6.59
B	Opuntia spp.	0	1	-	-
B	Pinus edulis	-	-	-	-
Total for Browse		184	179	20.68	22.65

CANOPY COVER --
Herd unit 13A, Study no: 7

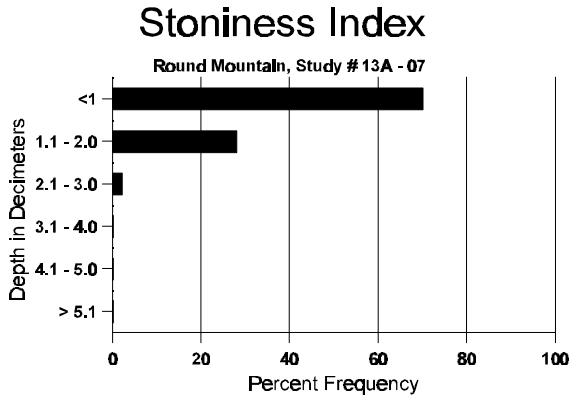
Species	Percent Cover '99
Juniperus osteosperma	4

BASIC COVER --
Herd unit 13A, Study no: 7

Cover Type	Nested Frequency '94	Nested Frequency '99	Average Cover % '87	Average Cover % '94	Average Cover % '99
Vegetation	324	344	8.25	22.44	29.63
Rock	361	298	32.00	30.60	23.46
Pavement	360	325	16.75	10.05	25.93
Litter	372	338	29.50	20.06	23.24
Cryptogams	121	71	.25	1.23	1.47
Bare Ground	359	253	13.25	24.26	8.07

SOIL ANALYSIS DATA --
Herd Unit 13A, Study # 07, Study Name: Round Mountain

Effective rooting depth (cm)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
9.6	69.2 (10.8)	7.8	58.9	19.8	21.3	1.9	60.4	48.0	0.4



PELLET GROUP DATA --
Herd unit 13A, Study no: 7

Type	Quadrat Frequency '94	Quadrat Frequency '99
Rabbit	8	9
Elk	-	3
Deer	49	40

Pellet Transect Days Use/Acre (ha) '99
N/A
2 (5)
78 (193)

BROWSE CHARACTERISTICS --
Herd unit 13A, Study no: 7

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	2	-	-	-	-	2	-	-	-	40	-	-	2
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	4	-	-	-	-	-	-	-	-	-	-	4	80			4
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	100%	00%	67%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:		0%
'94	0			0%
'99	120			67%

Artemisia tridentata wyomingensis																		
S	87	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	1	10	21	-	-	-	-	-	-	32	-	-	-	2133			32
	94	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	99	-	-	-	-	1	-	-	-	-	1	-	-	-	20			1
M	87	-	5	19	-	-	-	-	-	-	24	-	-	-	1600	16	27	24
	94	26	9	1	-	-	-	-	-	-	31	-	5	-	720	18	36	36
	99	-	9	12	-	6	11	-	-	-	38	-	-	-	760	18	29	38
D	87	1	9	6	-	-	-	-	-	-	14	-	1	1	1066			16
	94	43	19	2	2	2	-	-	-	-	36	-	4	28	1360			68
	99	1	9	8	4	2	13	3	-	-	24	-	-	16	800			40
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	800			40
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	840			42

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	33%	64%	03%	-55%
'94	28%	03%	35%	-26%
'99	34%	56%	20%	

Total Plants/Acre (excluding Dead & Seedlings)			
'87	4799	Dec:	22%
'94	2140		64%
'99	1580		51%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Atriplex canescens																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	27	43	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Coleogyne ramosissima																		
S	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	87	6	1	4	-	-	-	-	-	-	11	-	-	-	733			11
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	1	1	-	-	-	-	-	-	-	2	-	-	-	40			2
M	87	1	4	10	-	-	-	-	-	-	15	-	-	-	1000	12	16	15
	94	141	27	1	-	11	-	-	-	-	159	-	21	-	3600	13	26	180
	99	81	40	12	37	-	-	-	-	-	170	-	-	-	3400	16	30	170
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	18	-	-	4	3	-	-	-	-	25	-	-	-	500			25
	99	1	-	-	1	-	-	1	-	-	2	-	-	1	60			3
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	19%	54%	00%	+58%
'94	20%	.48%	10%	-15%
'99	23%	07%	.57%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	1733	Dec:	0%
	'94	4120		12%
	'99	3500		2%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Ephedra viridis																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	87	-	-	1	-	-	-	-	-	-	1	-	-	-	66	4	2	1
	94	-	1	-	-	-	-	-	-	-	1	-	-	-	20	19	22	1
	99	-	-	1	-	-	-	-	-	-	1	-	-	-	20	25	31	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	100%	00%	-39%
'94	50%	00%	00%	+50%
'99	00%	25%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	66	Dec:	-
	'94	40		-
	'99	80		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	87	6	-	-	-	-	-	-	-	-	6	-	-	-	400			6
	94	122	19	-	3	-	-	-	-	-	144	-	-	-	2880			144
	99	8	-	-	-	-	-	-	-	-	8	-	-	-	160			8
Y	87	24	2	7	-	-	-	-	-	-	33	-	-	-	2200			33
	94	31	-	-	-	-	-	-	-	-	31	-	-	-	620			31
	99	42	-	-	-	-	-	-	-	-	42	-	-	-	840			42
M	87	35	2	-	-	-	-	-	-	-	37	-	-	-	2466	8	6	37
	94	67	-	-	1	-	-	-	-	-	68	-	-	-	1360	9	11	68
	99	129	-	-	1	-	-	-	-	-	130	-	-	-	2600	7	10	130
D	87	2	-	-	-	-	-	-	-	-	-	-	-	2	133			2
	94	11	1	-	-	-	-	-	-	-	10	-	-	2	240			12
	99	6	-	-	-	-	-	-	-	-	3	-	-	3	120			6
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	380			19
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	340			17

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	06%	10%	03%	-54%
'94	.90%	00%	02%	+38%
'99	00%	00%	02%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	4799	Dec:		3%
'94	2220			11%
'99	3560			3%

Juniperus osteosperma																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	66	Dec:		-
'94	0			-
'99	60			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	12	7	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:	-
'94	0		-
'99	20		-

Trend Study 13A-8-99

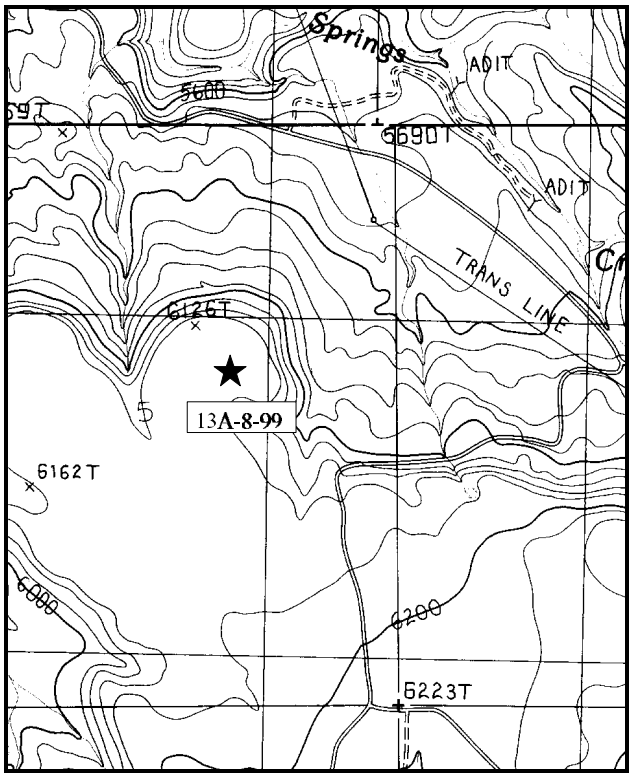
Study site name: Black Ridge . Range type: Chained, Seeded, P-J .

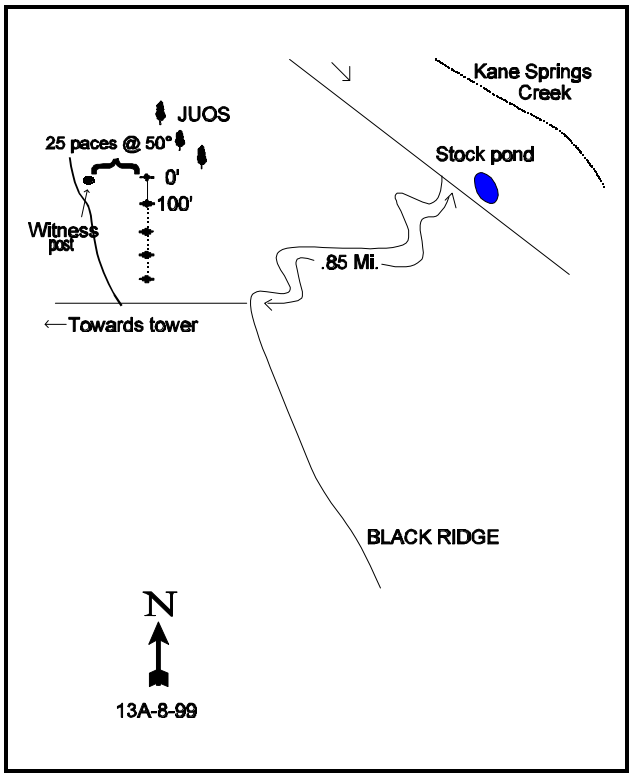
Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Travel south from Moab on SR 191 to just past mile marker 113, where a road turns off to Black Ridge and Yellow Circle Mine. Turn left and go 4.5 miles on the main road to the top of the ridge. Turn right onto a faint dirt road bearing west towards the relay tower. Go 0.15 miles to a faint fork. Bear right and continue 0.3 miles. Stop by a witness post on the right side of the road. The baseline starts 25 paces away from the witness post at 50°M. The 0-foot stake is tagged #7173.





Map Name: Kane Springs Diagrammatic Sketch

Township 28S , Range 23E , Section 5 UTM 4250519.850 N, 638718.050 E

DISCUSSION

Trend Study No. 13A-8 (33-8)

The Black Ridge study is one of the lower elevation critical deer winter ranges on the southwest side of the LaSal Mountains. The site is located approximately ½ mile south of the mesas edge, near the middle of the chained area. Slope and aspect are negligible with an elevation of 6,100 feet. This large mesa, managed by the BLM, had been chained many years ago and must have been seeded mostly to crested wheatgrass for that is the only seeded species present at this time. Deer use appears to be greatest along the north rim above Kane Springs Creek. Cattle use the area during the spring, as they move up the mountain to the U.S. Forest Service administered lands. Pellet group surveys of the area in 1999 indicate the following use: 20 cow days use/acre (49 cdu/ha) and 94 deer days use/acre (232 ddu/ha).

The soil is classified as an upland sandy clay loam. Soil on the site appears to be moderately deep (effective rooting depth of almost 16 inches) and mostly free of rock. There are no gullies or other evidence of significant water caused erosion. Wind erosion does cause soil movement on this site due to the high percentage of unprotected, loose sandy soil. The soil is mildly alkaline (7.5 pH). Besides annual precipitation, site potential can also be limited by the amount of phosphorus in the soil (5.8 ppm where 10 ppm is thought to be the minimum for normal plant development) and the moderately high soil temperatures (69°F at 17 inches). These higher soil temperatures and early spring use by livestock will severely limit the persistence of cool season grasses. These site features favor winter annuals like cheatgrass.

Wyoming big sagebrush is unquestionably the dominant browse over a large area. In 1994, the sagebrush provided almost 15% cover with an estimated population of 4,180 plants/acre. They currently provide only about 12% cover and their numbers have decreased by 21% to 3,300 plants/acre. Young plants were surprisingly abundant (72% of the population) in 1987, now they have gone from 6% (1994) to 4% (1999) of the population. Biotic potential (proportion of seedlings to population) was moderately high in 1987 (36%). This has gone from 25% (1994) to zero in 1999. Twelve percent of the population had exhibited heavy use in 1987. This has now gone from 4% (1994) to 42% in 1999. Those individuals displaying poor vigor have increased from 1% (1987) up to 18% (1994), to where it is now down to 4% (1999). Percent decadence had increased significantly from 3% (1987) to 23% (1994). It is currently at 13%. The one parameter that best illustrates the effect of long term drought to this low elevation sagebrush community is the ratio of dead to live plants which is one dead for every eight live plants. How can one get a real handle on what is happening to this sagebrush community? The following four basic parameters show fundamentally what is happening to this community: strip frequency is down, population is down by 21%, cover values are down, and average crown diameter is reduced. Trend for Wyoming big sagebrush is down. A nearby clump of mature juniper shows pronounced highlining, but there is visibly very little evidence of invading young trees on this dry site.

The seeding had established a fair stand of crested wheatgrass, although it has significantly decreased in nested frequency value with the prolonged drought from 1987 through 1994. Although this trend continues, it is at a slower rate. In some places crested wheatgrass is almost a monoculture. Diversity is very low throughout this community. Other perennial grasses observed in the area include Indian ricegrass, bottlebrush squirreltail, and three-awn. Annual grasses made up almost 20% of the grass cover in 1994, now they make up 39% of the grass cover. Forbs are almost nonexistent contributing less than 1% of the vegetative cover in 1994. Only one species was sampled in 1999, occurring in only a single quadrat. On average, Wyoming big sagebrush and crested wheatgrass make up 88% of the total vegetative cover.

Percent litter cover has continually decreased since 1987. With the continuing drought, it is at its all time low of 16%. Percent bare soil is at its highest since 1987 at 61%. Total vegetative cover is fairly low for this type of site, but soil erosion is still quite low because of the level terrain.

1994 TREND ASSESSMENT

The trend for soil is stable even with the large amounts of bare ground and low litter cover because of the mitigating physical characteristics of the site. Browse trend is down because of the increased rates of decadency, increased numbers of plants expressing poor vigor, and fairly high ratio of dead to living plants. The herbaceous understory trend is stable with the nested frequency values for perennial species being fairly stable, but the understory species are still in fairly poor condition with regard to productivity and species diversity.

TREND ASSESSMENT
soil - stable, but poor condition
browse - down
herbaceous understory - stable, but poor condition

1999 TREND ASSESSMENT

The tend for soil is slightly down with decreases in litter cover, decreases in vegetative cover, and increases in percent bare soil. Even with these poor conditions, erosion is minor on this site because of the moderating physical characteristics of the site. Trend for sagebrush continues to be down because of continued losses in numbers, strip frequency is decreasing, no seedlings, and percent young has decreased to only 4% of the population. The ratio of dead to living plants is still relatively high at one for every 10 plants. The herbaceous understory trend is down for perennials as well as for annuals. Only a single forb was found on this site in 1999.

TREND ASSESSMENT
soil - slightly down, continued poor condition
browse - down
herbaceous understory - down, very poor condition

HERBACEOUS TRENDS --
Herd unit 13A, Study no: 8

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
G	Agropyron cristatum	$_{b}$169	$_{a}$142	$_{a}$145	72	56	60	5.48	3.14
G	Aristida longiseta	$_{a}$-	$_{b}$8	$_{ab}$4	-	3	1	.09	.03
G	Bromus tectorum (a)	-	192	197	-	68	66	1.47	2.03
G	Sitanion hystrix	$_{b}$21	$_{c}$43	$_{a}$4	12	18	2	.11	.01
G	Vulpia octoflora (a)	-	$_{b}$91	$_{a}$9	-	37	4	.23	.02
Total for Annual Grasses		0	283	206	0	105	70	1.71	2.05
Total for Perennial Grasses		190	193	153	84	77	63	5.69	3.18
Total for Grasses		190	476	359	84	182	133	7.40	5.24
F	Astragalus amphioxys	1	-	-	1	-	-	-	-
F	Descurainia pinnata (a)	-	3	-	-	1	-	.00	-
F	Eriogonum cernuum (a)	-	$_{b}$47	$_{a}$-	-	19	-	.12	-
F	Eriogonum ovalifolium	5	-	-	2	-	-	-	-

Type	Species	Nested Frequency '87	'94	'99	Quadrat Frequency '87	'94	'99	Average Cover % '94	'99
F	Lappula occidentalis (a)	-	$_{b}$5	$_{a}$-	-	4	-	.02	-
F	Machaeranthera grindelioides	$_{b}$15	$_{a}$4	$_{a}$1	6	2	1	.01	.00
Total for Annual Forbs		0	55	0	0	24	0	0.15	0
Total for Perennial Forbs		21	4	1	9	2	1	0.01	0.00
Total for Forbs		21	59	1	9	26	1	0.16	0.00

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 13A, Study no: 8

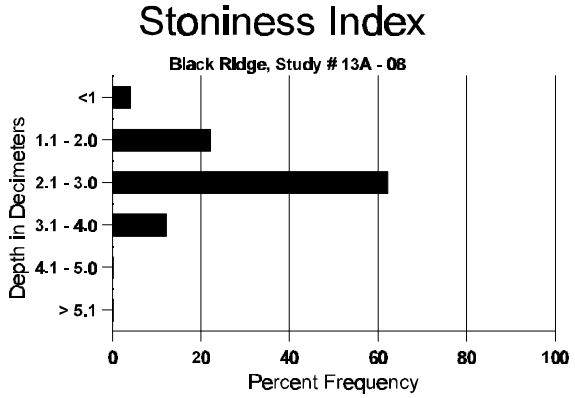
Type	Species	Strip Frequency '94	'99	Average Cover % '94	'99
B	Artemisia tridentata wyomingensis	78	75	14.63	11.89
B	Atriplex canescens	0	0	-	-
B	Ephedra viridis	0	0	-	-
B	Gutierrezia sarothrae	0	0	-	-
B	Opuntia spp.	2	1	.38	-
B	Sclerocactus	0	0	-	-
Total for Browse		80	76	15.01	11.89

BASIC COVER --
Herd unit 13A, Study no: 8

Cover Type	Nested Frequency '94	'99	Average Cover % '87	'94	'99
Vegetation	323	287	7.00	20.77	16.72
Rock	24	-	0	.05	0
Pavement	53	54	0	.12	.28
Litter	389	350	40.50	29.28	15.99
Cryptogams	44	57	.75	.41	1.38
Bare Ground	351	372	51.75	54.25	60.84

SOIL ANALYSIS DATA --
Herd Unit 13A, Study # 08, Study Name: Black Ridge

Effective rooting depth (cm)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
15.7	68.8 (17.1)	7.5	56.9	19.8	23.3	10.4	5.8	19.2	0.4



PELLET GROUP DATA --
Herd unit 13A, Study no: 8

Type	Quadrat Frequency '94	Quadrat Frequency '99	Pellet Transect Days Use/Acre (ha) '99
Rabbit	59	17	N/A
Deer	45	29	94 (232)
Cattle	-	-	20 (49)

BROWSE CHARACTERISTICS --
Herd unit 13A, Study no: 8

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
S	87	84	-	-	-	-	-	1	-	-	80	5	-	-	2833			85
	94	51	-	-	2	-	-	-	-	-	53	-	-	-	1060			53
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	115	50	2	-	-	-	1	-	-	166	1	1	-	5600			168
	94	13	-	-	-	-	-	-	-	-	13	-	-	-	260			13
	99	2	3	1	-	-	-	-	-	-	6	-	-	-	120			6
M	87	-	38	21	-	-	-	-	-	-	54	3	2	-	1966	23	33	59
	94	117	24	3	-	2	-	-	-	-	134	-	12	-	2920	19	32	146
	99	2	78	49	-	-	8	-	-	-	137	-	-	-	2740	19	30	137
D	87	-	2	6	-	-	-	-	-	-	7	1	-	-	266			8
	94	36	5	6	-	3	-	-	-	-	22	3	18	7	1000			50
	99	1	9	8	-	-	4	-	-	-	15	-	-	7	440			22
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	520			26
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	320			16

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	38%	12%	01%	-47%
'94	16%	04%	18%	-21%
'99	55%	42%	04%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:
	'87	7832	3%
	'94	4180	24%
	'99	3300	13%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Atriplex canescens																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	16	24	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	0		-

Ephedra viridis																		
M	87	-	1	-	-	-	-	-	-	-	1	-	-	-	33	20	22	1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	100%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	33	Dec:	-
	'94	0		-
	'99	0		-

Gutierrezia sarothrae																		
S	87	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	1	-	-	-	-	-	-	-	-	1	-	-	-	33	12	13	1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	66	Dec:	-
	'94	0		-
	'99	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	3	-	-	-	-	-	-	-	-	3	-	-	-	60	5	25	3
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	5	5	1
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	-67%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	60		-
	'99	20		-

Sclerocactus																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	2	3	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	0		-

Trend Study 13A-9-99

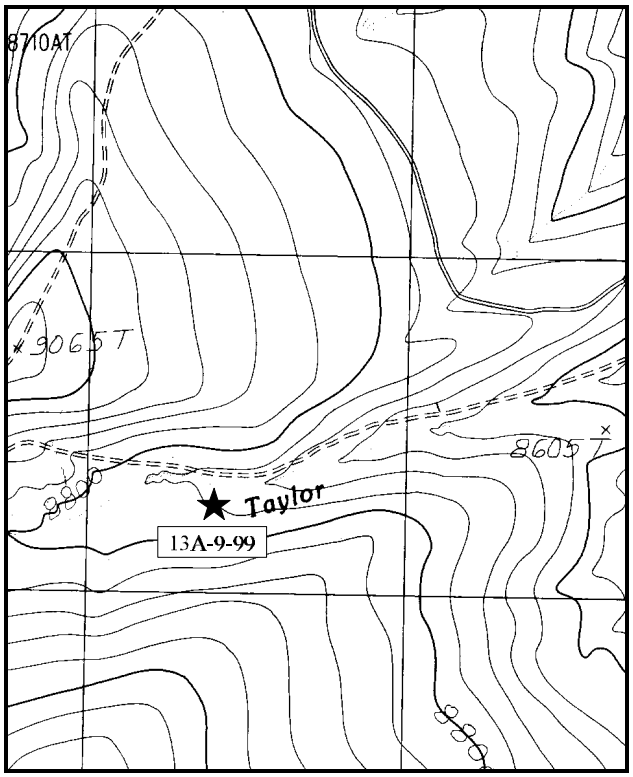
Study site name: Taylor Flat . Range type: Snowberry .

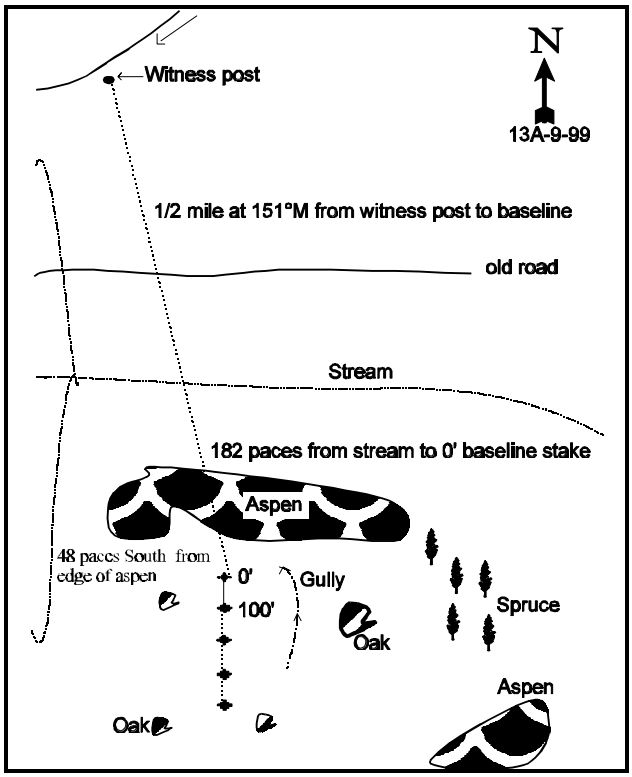
Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the intersection of the LaSal Mountain Loop Road and the Gateway Road at the upper end of Castle Valley, travel 12.7 miles towards Gateway, Colorado to the Sally Hollow turnoff. Turn right and go 0.55 miles to a fork. Turn right off the main road and go 1.3 miles to the top of a little knob. Stay straight at the fork and continue 0.15 miles to a witness post. From here, you can see the area of the transect on the ridge to the south. It is located about half way up the slope just above a large patch of aspens. From the witness post, walk approximately one-half mile down the slope, across a stream and up the other side at a bearing of 151°M.





Map Name: Mount Waas Diagrammatic Sketch

Township 26S , Range 25E , Section 16 UTM 4267847.441 N, 659765.227 E

DISCUSSION

Trend Study No. 13A-9 (33-9)

The Taylor Flat study is located on the slopes above Taylor Flat, in the headwaters of Taylor Creek. It is considered an important big game summer range, especially for elk as a calving area. It is on the large block of state land on the northeast side of the LaSal Mountains. The area is grazed by cattle, horses, and sheep on a rotation system. Pellet group studies done on the immediate area showed 11 elk days use/acre (27 edu/ha) and 23 cow days use/acre (57 cdu/ha). The vegetation on these slopes is predominately a mixture of aspen, clumps of oak, and open meadows dominated by snowberry or Rocky Mountain iris. The snowberry-forb type sampled by the study is on a 5-11% northwest-facing slope at an elevation of 9,000 feet.

The soil is a moderately deep (effective rooting depth of almost 20 inches) clay loam with a high percentage of rock. It is a moderately acidic soil with a ph of 5.9. The sandstone rock varies in size from small cobbles in the surface layer to large lichen-covered boulders. Several gullies on the hillside show evidence of continued soil loss, as does the stream in the valley bottom with recent cutting and bank losses. The soil has a rather high erosion potential. However, current soil protection is adequate to keep soil movement to a minimum except within the already established gullies.

Snowberry is the dominant shrub on the site, contributing 73% of the browse cover in 1994 and 1999. More than 80% of the population are mature plants with most showing only light use. No large, mature oak clumps were sampled, but some young trees are increasing into the open areas. The mature plants do not produce much available forage, but the young available sprouts are often browsed. The other shrubs sampled include Woods rose and shrubby cinquefoil which appear to have young increasing populations.

The herbaceous understory is very dense and diverse, contributing an average of 77% of the total vegetative cover at the site. There are 16 species of grasses on the site, with Thurber fescue and Kentucky bluegrass providing on average 63% of the grass cover. Forbs dominate the herbaceous understory providing an average 64% of the herbaceous cover. More than 30 species of forbs were sampled on the transect in 1999. The more palatable forbs such as dandelion, peavine, lupine, and Oregon fleabane had been selectively grazed by elk. The iris, a very common increaser on this site, is considered worthless as a forage plant and poisonous to livestock. In many places this vigorously spreading rhizomatous plant is becoming quite dense. Overall, the forb and grass population is vigorous, diverse, and dense keeping percent bare ground low at only about 3%. The major concern with this site is that 76% of the herbaceous cover is provided by increaser weedy species.

The dense herbaceous understory certainly helps stabilize the soil on this hillside. Vegetative cover is excellent on this site with litter cover at 65%. Most of the bare soil is caused by burrowing mammals.

1994 TREND ASSESSMENT

Soil trend for this site is stable with excellent vegetative cover and litter cover and very little bare soil. Much of the eroding gullies will probably have to have some kind of treatment to stabilize them. The browse trend is stable, but not key for this summer range. The trend for grasses is slightly improved, while the trend for the forbs is slightly down with the extended drought since 1985.

TREND ASSESSMENT
soil - stable
browse - stable
herbaceous understory - stable for grasses and slightly down for forbs, overall trend is stable

1999 TREND ASSESSMENT

Soil trend for this site is slightly improved with increases in litter cover and vegetative cover and a decrease in percent bare soil. Many of the eroding gullies should probably have some kind of treatment to help stabilize them. The browse trend is stable, but not key for this summer range. The trend for grasses is stable, while the trend for the forbs is slightly up from the nested values of 1994 and forbs make up 69% of the herbaceous cover.

TREND ASSESSMENT
soil - slightly improved
browse - stable
herbaceous understory - stable for grasses and slightly up for forbs, overall trend is stable to slightly up

HERBACEOUS TRENDS --
Herd unit 13A, Study no: 9

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
G	Agropyron trachycaulum	a62	ab65	b91	25	29	42	.49	.96
G	Bromus anomalus	a-	ab3	b22	-	3	9	.04	.72
G	Bromus carinatus	b88	a7	a26	34	2	12	.01	.19
G	Carex spp.	b108	a65	a55	41	24	24	1.28	.89
G	Danthonia californica	a-	b51	a-	-	21	-	.73	-
G	Festuca ovina	a30	c88	b51	13	35	19	1.69	1.11
G	Festuca thurberi	a-	b127	b107	-	46	40	8.10	3.51
G	Koeleria cristata	a-	b24	a5	-	10	2	.10	.03
G	Melica spp.	b13	a-	a-	5	-	-	-	-
G	Muhlenbergia spp.	a-	a-	b13	-	-	6	-	.06
G	Phleum alpinum	a-	ab1	b5	-	1	3	.00	.04
G	Phleum pratense	32	35	37	11	14	15	.70	.80
G	Poa arida	c265	b85	a33	104	30	14	2.69	.75
G	Poa pratensis	a33	b170	c277	10	53	82	4.01	9.52
G	Sitanion hystrix	a-	b8	ab3	-	4	1	.04	.00
G	Stipa columbiana	a-	b9	ab2	-	5	1	.24	.04
G	Stipa comata	a3	b16	a-	1	6	-	.15	-
G	Stipa lettermani	a-	b25	c46	-	8	15	.11	1.61
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		634	779	773	244	291	285	20.44	20.27
Total for Grasses		634	779	773	244	291	285	20.44	20.27
F	Achillea millefolium	b231	a171	b237	79	70	85	1.77	4.91
F	Agoseris glauca	-	6	4	-	2	2	.01	.18
F	Allium geyeri	b93	a11	a8	41	5	4	.03	.04

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
F	Antennaria parvifolia	$_{b}$74	$_{a}$21	$_{a}$24	29	8	12	.28	.47
F	Androsace septentrionalis (a)	-	$_{a}$1	$_{b}$20	-	1	8	.00	.04
F	Arabis spp.	$_{b}$13	$_{a}$-	$_{a}$4	7	-	2	-	.03
F	Arenaria congesta	$_{b}$107	$_{ab}$82	$_{a}$59	42	36	28	1.03	.36
F	Aster spp.	$_{a}$-	$_{b}$34	$_{c}$75	-	14	35	.29	1.35
F	Calochortus gunnisoni	21	13	21	12	6	10	.03	.08
F	Castilleja linariaefolia	-	-	3	-	-	1	-	.03
F	Cerastium arvense	$_{b}$92	$_{b}$92	$_{a}$35	43	35	16	.40	1.24
F	Cirsium spp.	-	-	-	-	-	-	.00	.03
F	Clematis hirsutissima	1	1	-	1	1	-	.03	-
F	Comandra pallida	27	22	32	13	9	13	.09	.26
F	Crepis acuminata	$_{b}$25	$_{a}$-	$_{b}$7	10	-	3	-	.04
F	Cruciferae	$_{b}$28	$_{a}$1	$_{a}$-	12	1	-	.00	-
F	Delphinium nuttallianum	$_{b}$42	$_{a}$-	$_{a}$-	22	-	-	-	-
F	Epilobium brachycarpum (a)	-	-	2	-	-	1	-	.03
F	Eriogonum elatum	-	2	-	-	1	-	.00	-
F	Erigeron flagellaris	$_{a}$13	$_{a}$8	$_{b}$48	6	6	19	.08	1.31
F	Erigeron spp.	$_{b}$102	$_{b}$40	$_{a}$-	43	15	-	.66	-
F	Eriogonum racemosum	$_{b}$6	$_{ab}$5	$_{a}$-	3	2	-	.06	-
F	Erigeron speciosus	$_{ab}$132	$_{b}$141	$_{a}$100	53	55	40	1.29	2.56
F	Galium boreale	$_{b}$164	$_{a}$106	$_{ab}$128	60	43	48	.93	.73
F	Geranium caespitosum	11	12	20	9	7	10	.14	.22
F	Haplopappus croceus	$_{b}$13	$_{a}$-	$_{a}$-	6	-	-	-	-
F	Helenium hoopesii	$_{a}$-	$_{b}$46	$_{b}$55	-	20	28	1.34	2.45
F	Heuchera parvifolia	11	19	16	5	7	9	.18	.24
F	Iris missouriensis	$_{a}$115	$_{b}$215	$_{b}$227	44	74	77	11.19	11.29
F	Lathyrus lanszwertii	$_{b}$183	$_{a}$125	$_{b}$179	70	46	66	2.30	5.34
F	Lewisia pygmaea	$_{b}$6	$_{ab}$1	$_{a}$-	3	1	-	.00	-
F	Linum lewisii	12	5	10	5	4	6	.02	.11
F	Lomatium spp.	$_{b}$58	$_{ab}$45	$_{a}$25	32	22	13	.19	.19
F	Lupinus argenteus	8	12	5	6	6	2	.34	.18
F	Lupinus sericeus	$_{b}$30	$_{a}$4	$_{a}$-	12	2	-	.03	-
F	Osmorhiza spp.	2	-	-	2	-	-	-	-
F	Penstemon spp.	$_{b}$22	$_{a}$-	$_{a}$-	13	-	-	-	-
F	Phacelia spp.	$_{b}$6	$_{a}$-	$_{a}$-	4	-	-	-	-
F	Potentilla anersina	-	-	3	-	-	1	-	.00
F	Polygonum douglasii (a)	-	$_{b}$10	$_{a}$-	-	5	-	.02	-
F	Potentilla gracilis	$_{b}$116	$_{ab}$97	$_{a}$72	49	43	34	.90	.80
F	Senecio integerrimus	$_{b}$135	$_{a}$6	25	60	2	13	.03	.15
F	Sedum lanceolatum	$_{b}$25	$_{a}$-	$_{a}$-	10	-	-	-	-

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
F	Taraxacum officinale	$_{b}$262	$_{a}$187	$_{a}$226	86	67	79	3.15	7.36
F	Thlaspi spp.	-	-	3	-	-	1	-	.00
F	Thermopsis montana	25	47	24	9	17	11	2.26	2.18
F	Tragopogon dubius	3	5	-	2	2	-	.01	-
F	Unknown forb-perennial	138	-	-	62	-	-	-	-
F	Vicia americana	$_{b}$61	$_{a}$27	$_{a}$32	25	13	14	.17	.48
F	Wyethia amplexicaulis	6	1	-	2	1	-	.00	-
Total for Annual Forbs		0	11	22	0	6	9	0.03	0.07
Total for Perennial Forbs		2419	1610	1707	992	643	682	29.36	44.74
Total for Forbs		2419	1621	1729	992	649	691	29.39	44.81

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 13A, Study no: 9

Type	Species	Strip Frequency		Average Cover %	
		'94	'99	'94	'99
B	Amelanchier utahensis	1	4	-	.06
B	Chrysothamnus viscidiflorus	0	0	-	-
B	Potentilla fruticosa	17	18	1.81	2.14
B	Quercus gambelii	0	18	2.04	2.48
B	Rosa woodsii	16	12	.23	.30
B	Symphoricarpos oreophilus	76	76	10.98	13.53
Total for Browse		110	128	15.07	18.52

CANOPY COVER --
Herd unit 13A, Study no: 9

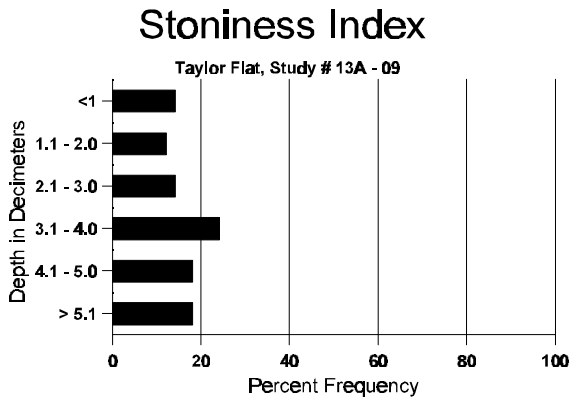
Species	Percent Cover '99
Quercus gambelii	2

BASIC COVER --
Herd unit 13A, Study no: 9

Cover Type	Nested Frequency		Average Cover %		
	'94	'99	'87	'94	'99
Vegetation	388	392	21.25	62.43	75.76
Rock	69	62	7.25	3.33	4.00
Pavement	15	35	0	.03	.22
Litter	373	384	60.50	49.25	64.97
Cryptogams	13	55	.75	.07	1.87
Bare Ground	179	95	10.25	7.42	3.17

SOIL ANALYSIS DATA --
Herd Unit 13A, Study # 09, Study Name: Taylor Flat

Effective rooting depth (cm)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
19.2	48.6 (18.1)	5.9	34.9	27.8	37.3	5.5	9.2	188.8	0.4



PELLET GROUP DATA --
Herd unit 13A, Study no: 9

Type	Quadrat Frequency '94	Quadrat Frequency '99	Pellet Transect Days Use/Acre (ha) '99
Rabbit	1	-	N/A
Elk	4	7	11 (27)
Deer	1	2	0
Cattle	-	6	23 (57)

BROWSE CHARACTERISTICS --
Herd unit 13A, Study no: 9

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier utahensis																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	2	-	-	-	-	-	-	-	2	-	-	-	40			2
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20	17	18	1
	99	-	1	1	-	-	-	-	-	-	2	-	-	-	40	15	16	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	+75%
'99	75%	25%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'87	0		-
	'94	20		-
	'99	80		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	15	23	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:		-
'94	0			-
'99	0			-

Potentilla fruticosa																		
S	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	87	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	94	9	-	-	3	-	-	2	-	-	14	-	-	-	280			14
	99	13	-	-	-	-	-	-	-	-	13	-	-	-	260			13
M	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66	18	15	1
	94	25	-	-	-	-	-	-	-	-	25	-	-	-	500	15	28	25
	99	34	-	-	-	-	-	-	-	-	34	-	-	-	680	16	27	34

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	+66%
'99	00%	00%	00%	+17%

Total Plants/Acre (excluding Dead & Seedlings)			
'87	266	Dec:	-
'94	780		-
'99	940		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Quercus gambelii																		
S	87	25	-	-	-	-	-	-	-	-	25	-	-	-	1666			25
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
Y	87	44	3	1	-	-	-	-	-	-	48	-	-	-	3200			48
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	4	-	-	16	-	-	15	-	-	35	-	-	-	700			35
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	15	2	-	-	-	-	-	11	-	27	-	1	-	560	54	34	28
D	87	1	-	1	-	-	-	-	-	-	2	-	-	-	133			2
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	2	-	-	-	-	-	2	40			2
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	06%	04%	00%	
'94	00%	00%	00%	
'99	03%	00%	05%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	3333	Dec:	4%
	'94	0		0%
	'99	1300		3%

Rosa woodsii																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
Y	87	12	-	-	-	-	-	-	-	-	12	-	-	-	800			12
	94	8	-	-	6	-	-	1	-	-	15	-	-	-	300			15
	99	18	-	-	-	-	-	-	-	-	18	-	-	-	360			18
M	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66	15	10	1
	94	19	-	-	3	-	-	-	-	-	22	-	-	-	440	12	8	22
	99	5	-	-	1	-	-	-	-	-	6	-	-	-	120	16	12	6

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	-15%
'94	00%	00%	00%	-35%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	866	Dec:	-
	'94	740		-
	'99	480		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
S	87	11	-	-	-	-	-	-	-	-	11	-	-	-	733			11
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	87	64	11	-	-	-	-	-	-	-	72	1	2	-	5000			75
	94	22	-	-	-	-	-	-	-	-	22	-	-	-	440			22
	99	25	1	-	-	-	-	-	-	-	26	-	-	-	520			26
M	87	32	52	2	-	-	-	-	-	-	84	-	2	-	5733	22	32	86
	94	190	-	2	-	-	-	1	-	-	193	-	-	-	3860	16	25	193
	99	159	12	-	6	-	-	-	-	-	176	-	1	-	3540	18	30	177
D	87	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	94	1	-	-	2	-	-	-	-	-	1	-	-	2	60			3
	99	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	39%	01%	02%	-60%
'94	00%	.91%	.91%	- 6%
'99	06%	00%	.98%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	10866	Dec:	1%
	'94	4360		1%
	'99	4080		0%

Trend Study 13A-10-99

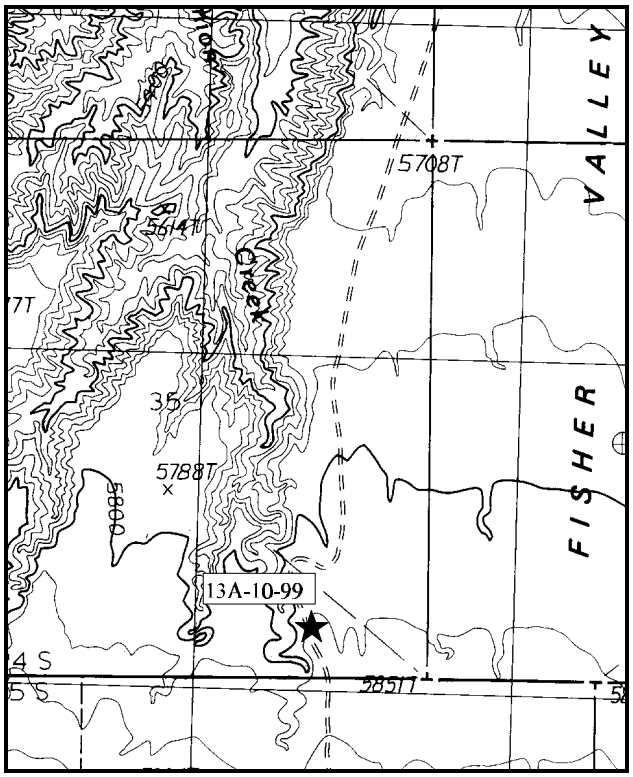
Study site name: Upper Fisher Valley . Range type: Big Sagebrush .

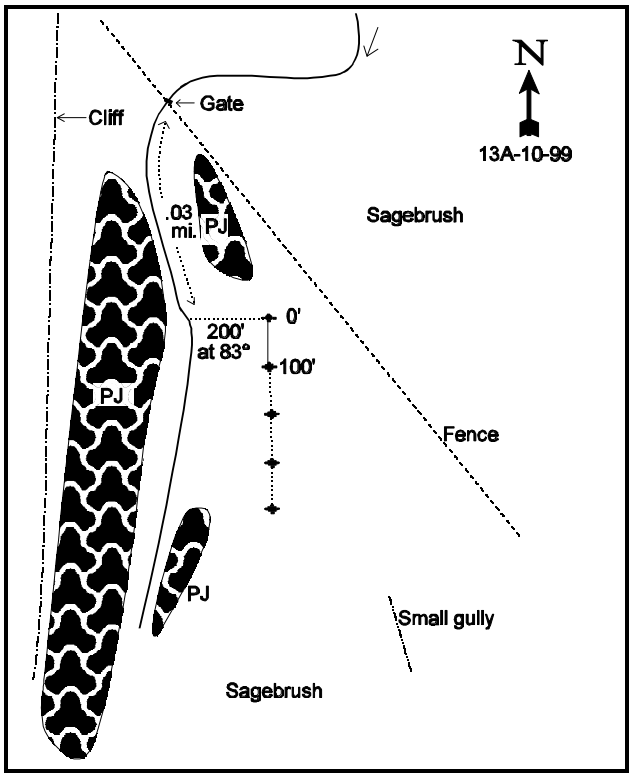
Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Leaving Moab on Route 128, drive northeast 0.1 miles past mile marker 20 (about 5 miles past the Castle Valley turnoff), and turn right onto the Fisher Valley Road. Go 8.7 miles up Onion Creek to a gate at the edge of the valley. Continue 0.25 miles to a dirt road that forks off to the right. Turn here and go 0.85 miles across an annual grass flat to a gate. Continue 1 mile to another fence. Go through the gate and 0.05 miles. The transect is located on the east side of the road about 200 feet out in the sagebrush. Study markers are l-foot tall green fence posts. The 0-foot baseline stake is tagged #7861.





Map Name: Fisher Valley Diagrammatic Sketch

Township 24S , Range 24E , Section 35 UTM 4281334.079 N, 653351.968 E

DISCUSSION

Trend Study No. 13A-10 (33-10)

Upper Fisher Valley is thought to be a critical wintering area for deer that migrate north and move off the LaSal Mountains. Pellet group surveys read in 1999 indicated that there were 26 cow days use/acre (64 cdu/ha) and 40 deer days use/acre (99 ddu/ha). Much of the pinyon-juniper woodlands and sagebrush communities in this valley have been historically treated and seeded. The particular area of this study, along the rim of Onion Creek, was two-way chained in 1960 and seeded to crested wheatgrass. Now, 40 years later, there is a moderately dense stand of Wyoming big sagebrush with little desirable understory.

This broad valley is almost level (4-5% slope) with a slight southerly aspect and an elevation of 5,800 feet. The reddish-brown, sandy clay loam soil appears to be moderately deep (effective rooting depth of almost 14 inches) on this site. Soil pH is neutral (6.8) with a low phosphorous content (7.8 ppm) where 10 ppm is considered necessary for normal plant development. It is not rocky, but appears to have a carbonate layer at approximately 8-10 inches below the surface. One of the major limiting factors on the site is the relatively high soil temperatures (over 71°F at 14 inches) which can be very limiting when coupled with long term drought. This warm environment would be especially conducive for the dominance of winter annuals on this site. There are two well-defined natural gullies east of the transect which are still active. Due to the levelness of the terrain, erosion is not a serious problem, although there is some pedestaling of the grasses and some soil movement in the large bare interspaces.

Wyoming big sagebrush is the dominant browse species as it made up 90% of the browse cover and 59% of the total vegetative cover in 1994. That has now changed to 75% of the browse cover and 48% of the total vegetative cover. Broom snakeweed was quite abundant in 1987, then its density fell significantly to 5,720 plants/acre. Currently, it has surpassed the 1987 density and is estimated at 13,220 plants/acre. This weedy increaser is again a dominant part of the understory. Broom snakeweed is not utilized, while the Wyoming big sagebrush is usually moderately hedged. In 1987, the sagebrush population exhibited characteristics of an apparently increasing population with a majority of the individuals being classified as seedlings or young. The vigor of 15% of the plants was affected by a high density of insect galls. The indications are currently showing that the sagebrush trend is down; its density is decreasing; biotic potential has gone from 49% in 1987, to 22% in 1994, to zero in 1999; strip frequency has gone down while that of broom snakeweed has increased; and the percentage of decadent plants classified as dying has increased from 31% to 65%. There are a few 8-10 foot tall junipers established on the flat. The point quarter method established juniper density at only 10 trees/acre with an average diameter of 5.5 inches. They appear to be moving very slowly down-slope from the line of mature pinyon-juniper on the west edge of the study area, along the rim of the canyon.

A fair stand of crested wheatgrass was sampled on the site in 1987. Trend for crested wheatgrass was up in 1994. Since then, its cover has decreased substantially along with nested frequency values. In 1994, it made up 25% of the grass cover, now it only makes up 7% of the grass cover. The dominant grass now is Sandberg bluegrass which makes up 71% of the grass cover. Other perennial grass species sampled on site included galleta, bottlebrush squirreltail, and blue grama. Annual grasses present on the site include cheatgrass and sixweeks fescue. Forbs are an insignificant source of forage on this site. There are several small species present, but none of which are very abundant. Ground cover is poor with percent bare ground almost at 50%. Litter cover is found mainly under the shrubs and it was very low in 1994 and 1999 at 24% and 17% respectively.

1994 TREND ASSESSMENT

Soil trend on this site is stable to slightly improving, but still in very poor condition. The type of cover that will best protect this site from erosion comes from herbaceous species which only make up 35% of the total vegetative cover. There has been some improvement of the perennial grasses (crested wheatgrass and Sandberg bluegrass), with some slight loss of forbs. However, forbs collectively only make up about 10% of the vegetative cover. The trend for the key browse, Wyoming big sagebrush, is up as only 8% of the population exhibited heavy use, while percent decadence is low at only 3%. Vigor is also good for the population. There has been a large increase in the estimated population, but much of this is from the much larger sample size taken in 1994. Yet, the increase is warranted because of the high biotic potential it had in 1987 and high percentage of plants that were classified as young at that time. The weedy increaser, broom snakeweed, has shown a dramatic decline since 1987. The trend for the herbaceous understory is stable to slightly improving with the increases for two of the perennial grasses, but the forbs are still almost nonexistent on this site with the extended drought.

TREND ASSESSMENT
soil - stable to slightly improving, but still very poor condition
browse - up
herbaceous understory - stable to slightly improving

1999 TREND ASSESSMENT

Soil trend on this site is slightly improving, but still in very poor condition. This improved condition is brought about mostly because of the significant increase in cryptogamic cover, from 1% to 11%. The type of cover that will best protect this site from erosion comes from herbaceous species which only make up 35% of the total vegetative cover. The trend for browse is down for Wyoming big sagebrush because of the losses in density, decrease in cover, decrease in strip frequency, biotic potential going from 22% to zero, and percent young has fallen from 12% to only 6%. The weedy increaser, broom snakeweed, has shown a dramatic increase since 1994. The trend for the herbaceous understory is down with nested frequency values for annuals and perennials going down. Forbs are almost nonexistent with the extended drought and total cover less than 1%.

TREND ASSESSMENT
soil - slightly improving, but still very poor condition
browse - down
herbaceous understory - down and very poor

HERBACEOUS TRENDS --
Herd unit 13A, Study no: 10

Type	Species	Nested Frequency '87	'94	'99	Quadrat Frequency '87	'94	'99	Average Cover % '94	'99
G	Agropyron cristatum	a63	b105	a72	27	42	32	2.48	.65
G	Agropyron intermedium	a-	a-	b7	-	-	3	-	.04
G	Bouteloua gracilis	a-	a-	b7	-	-	3	-	.04
G	Bromus tectorum (a)	-	106	104	-	42	43	.88	.38
G	Hilaria jamesii	94	93	79	41	40	37	.96	.80
G	Poa secunda	a224	ab246	b256	84	86	86	3.77	6.50
G	Sitanion hystrix	b24	b6	a7	10	2	3	.01	.21

Type	Species	Nested Frequency '87	Nested Frequency '94	Nested Frequency '99	Quadrat Frequency '87	Quadrat Frequency '94	Quadrat Frequency '99	Average Cover % '94	Average Cover % '99
G	Stipa comata	$_{b}$7	$_{a}$-	$_{a}$-	3	-	-	-	-
G	Vulpia octoflora (a)	-	76	61	-	32	27	.16	.55
Total for Annual Grasses		0	182	165	0	74	70	1.03	0.94
Total for Perennial Grasses		412	450	428	165	170	164	7.23	8.25
Total for Grasses		412	632	593	165	244	234	8.27	9.19
F	Astragalus amphioxys	$_{b}$7	$_{ab}$4	$_{a}$-	3	2	-	.01	-
F	Calochortus nuttallii	1	-	-	1	-	-	-	-
F	Cruciferae	1	-	-	1	-	-	-	-
F	Draba reptans (a)	-	22	9	-	9	4	.04	.02
F	Erigeron pumilus	6	10	12	3	5	5	.02	.05
F	Gilia spp. (a)	-	5	-	-	2	-	.01	-
F	Leucelene ericoides	-	1	2	-	1	1	.00	.03
F	Lesquerella spp.	-	-	1	-	-	1	-	.00
F	Oenothera albicaulis (a)	1	-	-	1	-	-	-	-
F	Phlox austromontana	$_{a}$21	$_{ab}$21	$_{b}$31	11	9	14	.81	.65
F	Ranunculus testiculatus (a)	-	$_{b}$14	$_{a}$-	-	6	-	.05	-
F	Sphaeralcea coccinea	$_{b}$62	$_{a}$22	$_{a}$5	25	11	3	.05	.01
F	Tragopogon dubius	4	-	-	2	-	-	-	-
F	Unknown forb-perennial	1	-	-	1	-	-	-	-
Total for Annual Forbs		1	41	9	1	17	4	0.10	0.01
Total for Perennial Forbs		103	58	51	47	28	24	0.90	0.75
Total for Forbs		104	99	60	48	45	28	1.01	0.77

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 13A, Study no: 10

Type	Species	Strip Frequency '94	Strip Frequency '99	Average Cover % '94	Average Cover % '99
B	Artemisia nova	0	0	-	-
B	Artemisia tridentata wyomingensis	85	78	15.69	13.69
B	Atriplex canescens	0	1	-	-
B	Gutierrezia sarothrae	78	86	.85	3.98
B	Juniperus osteosperma	0	1	.88	.66
B	Opuntia spp	0	0	-	-
B	Pinus edulis	0	0	.00	-
Total for Browse		163	166	17.43	18.34

CANOPY COVER --
Herd unit 13A, Study no: 10

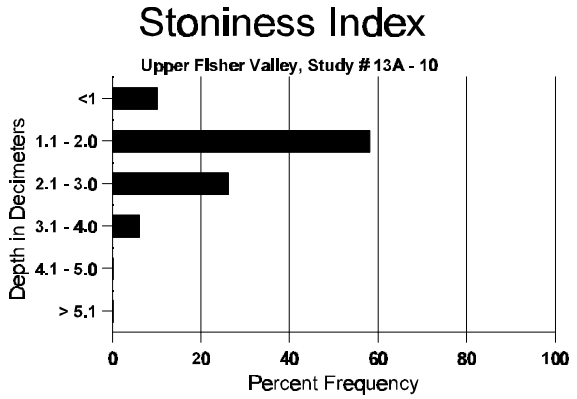
Species	Percent Cover '99
Juniperus osteosperma	.40

BASIC COVER --
Herd unit 13A, Study no: 10

Cover Type	Nested Frequency '94	'99	Average Cover % '87	'94	'99
Vegetation	317	309	8.00	23.64	25.24
Rock	2	-	0	.00	0
Pavement	3	3	0	.00	.00
Litter	391	358	32.25	24.45	17.47
Cryptogams	148	221	1.00	1.28	10.75
Bare Ground	366	341	58.75	57.47	48.54

SOIL ANALYSIS DATA --
Herd Unit 13A, Study # 10, Study Name: Upper Fisher Valley

Effective rooting depth (cm)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
13.9	71.2 (15.3)	6.8	58.9	15.8	25.3	1.6	7.8	73.6	0.4



PELLET GROUP DATA --
Herd unit 13A, Study no: 10

Type	Quadrat Frequency '94	'99	Pellet Transect Days Use/Acre (ha) '99
Rabbit	68	30	N/A
Deer	53	28	40 (99)
Cattle	1	11	26 (64)

BROWSE CHARACTERISTICS --
Herd unit 13A, Study no: 10

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia nova																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	5	11	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'87	0		-
	'94	0		-
	'99	0		-

Artemisia tridentata wyomingensis																		
S	87	46	1	-	-	-	-	-	-	-	46	1	-	-	3133			47
	94	67	-	-	1	-	-	-	-	-	61	-	-	7	1360			68
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	38	9	-	-	-	-	1	-	-	34	13	1	-	3200			48
	94	36	-	-	-	-	-	-	-	-	35	1	-	-	720			36
	99	10	4	-	-	-	-	-	-	-	14	-	-	-	280			14
M	87	16	24	1	-	-	-	-	-	-	35	5	1	-	2733	21	25	41
	94	222	19	-	-	-	-	-	5	-	215	8	19	4	4920	20	30	246
	99	104	107	10	-	-	-	-	-	-	221	-	-	-	4420	22	34	221
D	87	1	5	-	-	-	-	-	-	-	5	1	-	-	400			6
	94	26	3	-	-	-	-	-	-	-	18	-	2	9	580			29
	99	7	8	2	-	-	-	-	-	-	6	-	-	11	340			17
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	40%	01%	02%	- 2%
'94	07%	00%	11%	-19%
'99	47%	05%	04%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'87	6333		6%
	'94	6220		9%
	'99	5040		7%

Atriplex canescens																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	43	66	0
	99	-	5	-	-	-	-	-	-	-	5	-	-	-	100	-	-	5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	100%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'87	0		-
	'94	0		-
	'99	100		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	87	39	-	-	-	-	-	-	-	-	39	-	-	-	2600			39
	94	20	-	-	-	-	-	1	-	-	21	-	-	-	420			21
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
Y	87	76	1	2	-	-	-	-	-	-	79	-	-	-	5266			79
	94	42	-	-	7	-	-	-	-	-	49	-	-	-	980			49
	99	194	-	-	-	-	-	-	-	-	194	-	-	-	3880			194
M	87	111	-	-	-	-	-	1	-	-	111	-	1	-	7466	11	9	112
	94	228	1	-	6	-	-	-	-	-	234	-	-	1	4700	7	7	235
	99	451	-	-	1	-	-	-	-	-	452	-	-	-	9040	10	10	452
D	87	7	-	-	-	-	-	-	-	-	5	-	-	2	466			7
	94	2	-	-	-	-	-	-	-	-	1	-	-	1	40			2
	99	15	-	-	-	-	-	-	-	-	6	-	-	9	300			15
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	400			20

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	.50%	01%	02%	-57%
'94	.34%	00%	.69%	+57%
'99	00%	00%	01%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	13198	Dec:	4%
	'94	5720		1%
	'99	13220		2%

Juniperus osteosperma																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	20		-

Opuntia spp.																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	6	16	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	9	12	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pinus edulis																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	0		-

Trend Study 13A-11-99

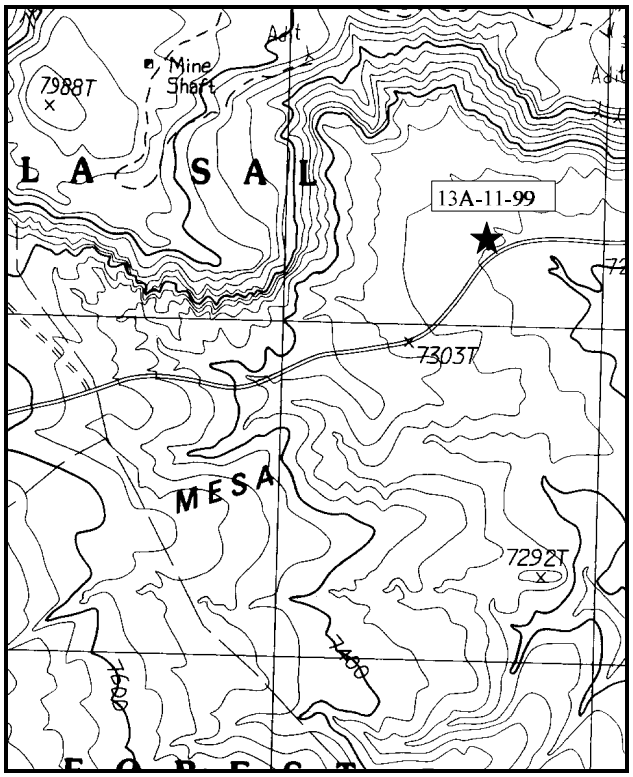
Study site name: North Beaver Mesa . Range type: Big Sagebrush .

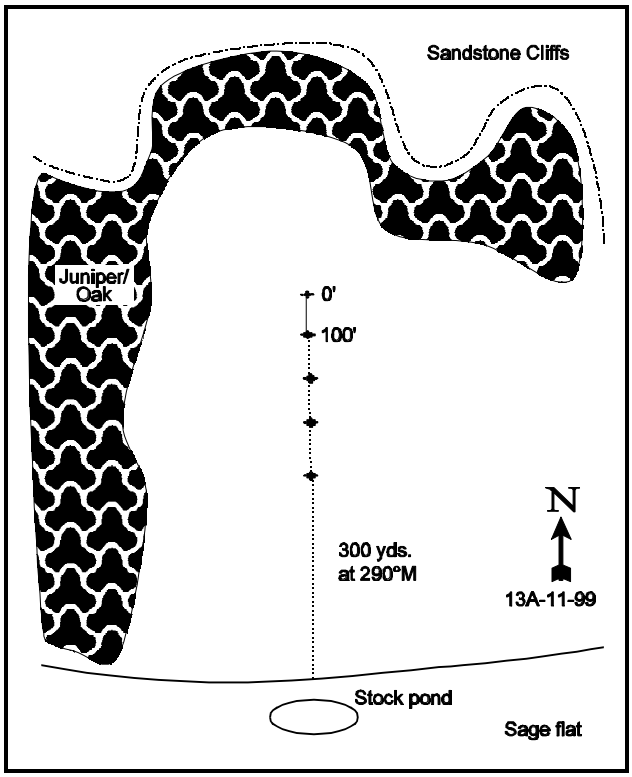
Compass bearing: frequency baseline 133°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the intersection of the LaSal Mountain Loop and Gateway roads, travel east towards Gateway, Colorado for 7.7 miles to the North Beaver Mesa turnoff. Turn left and go 4.2 miles to the Polar Mesa/Fisher Valley Road. Continue straight through this fork, over a cattleguard and 0.85 miles to a stockpond at the head of a large sagebrush valley. The transect is located to the west towards an alcove. It is marked by l-foot tall fence posts. The 0-foot baseline stake is furthest away and is tagged #7842.





Map Name: Fisher Valley Diagrammatic Sketch

Township 25S , Range 25E , Section NE 1/4,10 UTM 4279392.142 N, 661326.424 E

DISCUSSION

Trend Study No. 13A-11 (33-11)

The North Beaver Mesa study is an area on the northeast side of the LaSal Mountains that receives a considerable amount of winter elk use. This was confirmed by 1994 pellet group frequency data showing that elk pellets had a 55% quadrat frequency, while deer had a frequency of 26%. Pellet group surveys in 1999 lent further support of this kind of use as they indicated there was 17 cow days use/acre (42 cdu/ha), 46 deer days use/acre (114 ddu/ha), and 155 elk days use/acre (383 edu/ha). The deer use the area mostly as a transition range in the spring and fall, depending on the severity of the winter. The Beaver allotment is grazed by cattle in the spring and fall. In 1962, 1,000 acres within the allotment was chained or contour trenched and seeded. A roller-chopper was used to retreat other parts of the allotment in 1985 and 1987, but did not include this area. The study is located in the upper part of a large sagebrush valley, where the only evidence of vegetative treatments is the partially filled-in contoured trenches and presence of seeded species (crested wheatgrass, intermediate wheatgrass, smooth brome, and alfalfa).

The study has a southeast aspect on a slope of less than 5% and an elevation of 7,300 feet. In contrast, to the east and west of the contour trenches, there are some natural gullies, especially further down in the valley. The trenches unquestionably help to slow down water and soil movement. These water and soil catchments also support the greatest grass cover. The reddish-brown, sandy loam soil appears to be moderately deep (effective rooting depth of 15 inches). The soil is neutral to slightly alkaline (7.4 pH) with a phosphorous content of 8.9 ppm. This could be a limiting factor for 10 ppm is thought to be the minimum for normal plant development. Livestock have a heavy impact on this soil for cattle trails and trampling have led to broken soil cover and soil movement.

Pinyon-juniper and oak clumps dominate the surrounding slopes. Except for a few seedlings, they are not very abundant in the sagebrush dominated valley bottoms. The point quarter method shows a pinyon density of 42 trees/acre with a average diameter of 1.25 inches and juniper density at 23 trees/acre with an average diameter of 6.75 inches. In addition to Wyoming big sagebrush, nine other browse species were encountered on the site. The available oak and scattered serviceberry have been highlined. White-stemmed rubber rabbitbrush is especially prevalent in the middle of the valley, with some plants showing moderate use. Other browse species are uncommon. Wyoming big sagebrush (on average) makes up 85% of the browse cover, with a moderately high density of 8,200 plants per acre in 1999. Almost half of the population was classified as young in 1987, declining to 18% by 1994, then increasing to 22% in 1999. Biotic potential (percentage of number of seedlings to the population) in 1987 was fairly good at 7%, increasing to 26% in 1994. It has since decreased again down to 5% in 1999. Seed production was low when it was first read, yet the mature plants appeared vigorous. Hedging is light to moderate on most plants.

As elk range, the grass component is especially important with an average of 84% of the grass cover coming from the three seeded species. However, with the grass being heavily utilized by livestock (late spring and summer), vigor is reduced and little forage is left for winter use. This is especially noticeable when coupled with summer drought, as was apparent with the 1994 data when grass cover was almost 25% less than in 1999.

Forb diversity is good with as many as 25 species sampled in 1994, however together they only provide a little over 4% cover. The common hairy goldaster is the most abundant forb (making up more than 50% of the forb cover) and it also has been heavily utilized. There are randomly scattered patches of alfalfa which were seldom picked up in the sampling design.

Percent litter cover is moderately low. Disturbance, compaction, trampling, and trailing caused by livestock grazing has disturbed the soil cover and hindered the development of cryptogamic soil. Percent bare ground is moderately high at 30%.

1994 TREND ASSESSMENT

The trend for soil is slightly improved, but still only in fair condition. Percent bare ground has gone down to 30% with litter cover decreasing slightly. Soils would be in much better condition if the herbaceous cover could be increased. This could occur with some rest from heavy early summer use. Browse trend is stable to slightly up even with the slight decrease noted in the population estimate. Much of the change is from the much larger sample size used in 1994. The population shows the characteristics of an expanding population with low rates of decadency and very high biotic potential. The trend for the herbaceous understory is stable because much of the change in nested frequency values was from the annual species.

TREND ASSESSMENT
soil - slightly improving, fair condition
browse - stable to slightly up
herbaceous understory - stable

1999 TREND ASSESSMENT

The trend for soil is basically unchanged and stable. Percent bare ground had gone down from the high in 1987 of 37% to 30% in 1994, with no change in 1999. Soils would be in much better condition if the herbaceous cover could be increased. This could occur with some type of management system of rest and deferment from heavy and continuous early summer use. Browse trend is stable to slightly up with increases in the sagebrush population, which on average makes up 85% of the browse cover. The population shows the characteristics of an expanding population with relatively low rates of decadency, and variable yet characteristically good biotic potential. The trend for the herbaceous understory is stable with increases for grasses but some losses for the forbs. The slight decrease in forb nested frequency is more than compensated for by the increase in grasses.

TREND ASSESSMENT
soil - stable, fair to good condition
browse - stable to slightly up
herbaceous understory - stable

HERBACEOUS TRENDS --
Herd unit 13A, Study no: 11

Type	Species	Nested Frequency '87	'94	'99	Quadrat Frequency '87	'94	'99	Average Cover % '94	'99
G	Agropyron cristatum	b258	a232	c291	88	88	94	7.13	12.09
G	Agropyron intermedium	a41	b67	b70	14	22	26	1.58	1.15
G	Bouteloua gracilis	5	8	5	2	3	3	.33	.30
G	Bromus inermis	24	13	14	10	4	5	.36	.24
G	Bromus tectorum (a)	-	42	36	-	15	12	1.66	.52
G	Sporobolus cryptandrus	a-	b10	ab4	-	5	2	.08	.01
G	Stipa comata	a-	b6	ab4	-	3	2	.01	.18
G	Vulpia octoflora (a)	-	2	-	-	1	-	.00	-
Total for Annual Grasses		0	44	36	0	16	12	1.66	0.52
Total for Perennial Grasses		328	336	388	114	125	132	9.50	13.98
Total for Grasses		328	380	424	114	141	144	11.16	14.51

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
F	Alyssum spp. (a)	-	3	-	-	1	-	.00	-
F	Arabis spp.	-	1	-	-	1	-	.00	-
F	Artemisia ludoviciana	a-	b9	ab3	-	3	1	.18	.03
F	Astragalus convallarius	8	16	12	4	9	4	.36	.07
F	Aster spp.	-	-	5	-	-	2	-	.01
F	Astragalus spp.	8	7	6	4	4	2	.02	.01
F	Castilleja linariaefolia	-	-	2	-	-	1	-	.00
F	Calochortus nuttallii	1	-	-	1	-	-	-	-
F	Collinsia parviflora (a)	-	b13	a-	-	5	-	.02	-
F	Cruciferae	b28	a-	a-	11	-	-	-	-
F	Delphinium nuttallianum	1	-	-	1	-	-	-	-
F	Draba reptans (a)	-	4	1	-	3	1	.01	.00
F	Eriogonum cernuum (a)	-	2	-	-	1	-	.00	-
F	Erigeron pumilus	25	14	18	14	7	9	.06	.19
F	Eriogonum racemosum	a27	b47	ab39	12	20	19	.30	.69
F	Euphorbia spp.	1	-	-	1	-	-	-	-
F	Fritillaria atropurpurea	a-	b10	a-	-	5	-	.02	-
F	Gayophytum ramosissimum (a)	-	3	-	-	2	-	.01	-
F	Heterotheca villosa	b214	a102	a78	81	47	40	2.76	2.44
F	Lactuca serriola	b4	a-	a-	3	-	-	-	-
F	Lepidium densiflorum (a)	-	3	-	-	1	-	.00	-
F	Lesquerella ludoviciana	3	2	3	1	2	1	.01	.00
F	Lithospermum ruderale	a-	b14	a-	-	7	-	.20	-
F	Machaeranthera canescens	15	26	16	8	11	8	.05	.31
F	Medicago sativa	a-	b10	ab4	-	4	1	.42	.18
F	Microsteris gracilis (a)	-	16	17	-	8	7	.04	.03
F	Oenothera coronopifolia	c39	b11	a-	15	6	-	.03	-
F	Oxybaphus linearis	-	1	-	-	1	-	.00	-
F	Petradoria pumila	1	-	-	1	-	-	-	-
F	Phlox longifolia	9	4	6	4	2	2	.01	.03
F	Polygonum douglasii (a)	-	1	8	-	1	3	.00	.01
F	Senecio multilobatus	3	-	-	1	-	-	-	-
F	Sphaeralcea coccinea	11	12	13	8	5	8	.05	.14
F	Tragopogon dubius	c17	b4	a-	10	3	-	.01	-
F	Trifolium spp.	4	-	-	1	-	-	-	-
F	Unknown forb-perennial	b11	a-	a-	6	-	-	-	-
Total for Annual Forbs		0	45	26	0	22	11	0.11	0.05
Total for Perennial Forbs		430	290	205	187	137	98	4.54	4.13
Total for Forbs		430	335	231	187	159	109	4.65	4.19

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 13A, Study no: 11

Type	Species	Strip Frequency '94	'99	Average Cover % '94	'99
B	Amelanchier utahensis	5	3	.15	.03
B	Artemisia frigida	2	4	.00	-
B	Artemisia tridentata wyomingensis	77	97	23.59	19.26
B	Atriplex canescens	2	2	-	.15
B	Chrysothamnus nauseosus	8	6	.49	.24
B	Eriogonum microthecum	11	14	.21	.25
B	Gutierrezia sarothrae	30	14	1.81	.57
B	Opuntia spp.	8	6	.11	.09
B	Pinus edulis	0	4	.53	2.07
B	Quercus gambelii	-	-	.85	-
Total for Browse		143	150	27.76	22.68

CANOPY COVER --
Herd unit 13A, Study no: 11

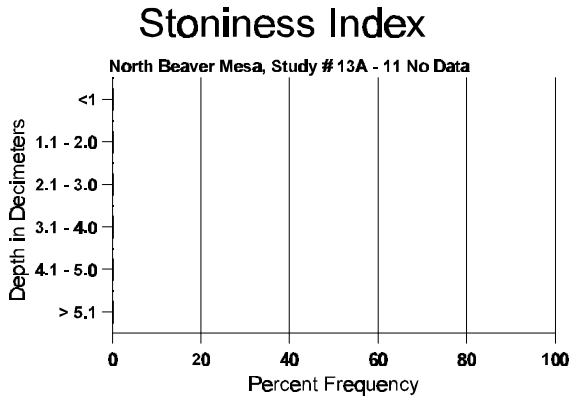
Species	Percent Cover '99
Pinus edulis	.80
Quercus gambelii	.40

BASIC COVER --
Herd unit 13A, Study no: 11

Cover Type	Nested Frequency '94	'99	Average Cover % '87	'94	'99
Vegetation	319	342	15.75	40.55	40.91
Rock	4	3	0	.15	.15
Pavement	20	16	0	.42	.11
Litter	377	345	43.50	41.52	40.15
Cryptogams	68	90	3.50	1.58	3.35
Bare Ground	306	269	37.25	30.21	29.78

SOIL ANALYSIS DATA --
Herd Unit 13A, Study # 11, Study Name: North Beaver Mesa

Effective rooting depth (cm)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
15.1	55.4 (16.7)	7.4	70.9	11.8	17.3	1.6	8.9	92.8	0.4



PELLET GROUP DATA --
Herd unit 13A, Study no: 11

Type	Quadrat Frequency '94	Quadrat Frequency '99	Pellet Transect Days Use/Acre (ha) '99
Rabbit	19	5	N/A
Horse	-	1	N/A
Elk	55	52	155 (383)
Deer	26	20	46 (114)
Cattle	-	5	17 (42)

BROWSE CHARACTERISTICS --
Herd unit 13A, Study no: 11

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier utahensis																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	2	-	-	-	-	-	-	-	1	3	-	-	-	60			3
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40	15	11	2
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	36	34	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	20%	00%	-40%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'87	0		-
	'94	100		-
	'99	60		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia frigida																		
S	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	8	-	1	-	-	-	-	-	-	9	-	-	-	600			9
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	5	-	-	-	-	-	-	-	-	5	-	-	-	100	8	9	5
	99	3	-	-	2	-	-	-	-	-	5	-	-	-	100	10	5	5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	11%	00%	-83%
'94	00%	00%	00%	+ 0%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	600	Dec:	-
	'94	100		-
	'99	100		-

Artemisia tridentata wyomingensis																		
S	87	11	-	-	-	-	-	-	-	-	9	1	1	-	733			11
	94	81	-	-	30	-	-	6	-	-	117	-	-	-	2340			117
	99	15	8	-	-	-	-	-	-	-	23	-	-	-	460			23
Y	87	52	24	-	-	-	-	-	-	-	76	-	-	-	5066			76
	94	39	9	-	8	-	-	-	-	-	56	-	-	-	1120			56
	99	41	49	2	-	-	-	-	-	-	92	-	-	-	1840			92
M	87	17	30	3	-	-	-	-	-	-	50	-	-	-	3333	19	22	50
	94	134	71	10	-	-	-	-	-	-	202	-	13	-	4300	16	28	215
	99	86	125	28	-	-	3	-	-	-	242	-	-	-	4840	24	36	242
D	87	21	5	3	-	-	-	-	-	-	26	-	1	2	1933			29
	94	20	14	2	-	-	-	-	-	-	16	-	9	11	720			36
	99	21	40	10	4	-	-	1	-	-	53	1	1	21	1520			76
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	420			21
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	660			33

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	38%	04%	02%	-41%
'94	31%	04%	11%	+25%
'99	52%	10%	05%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	10332	Dec:	19%
	'94	6140		12%
	'99	8200		19%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Atriplex canescens																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	2	-	-	-	-	-	-	-	2	-	-	-	40	16	19	2
	99	-	1	-	-	-	-	-	-	-	1	-	-	-	20	20	15	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	67%	00%	00%	+25%
'99	25%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	60		-
	'99	80		-

Chrysothamnus nauseosus																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	-	1	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	3	-	-	-	-	-	-	-	-	2	-	1	-	60			3
	99	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	87	2	-	1	-	-	-	-	-	-	1	-	2	-	200	34	25	3
	94	8	-	-	-	-	-	-	-	-	8	-	-	-	160	29	26	8
	99	4	-	-	-	-	-	-	-	-	4	-	-	-	80	20	32	4
D	87	1	-	-	-	-	-	-	-	-	-	1	-	-	66			1
	94	1	-	-	-	-	-	-	-	-	-	-	1	-	20			1
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	20%	20%	40%	-28%
'94	00%	00%	17%	-17%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	332	Dec:	20%
	'94	240		8%
	'99	200		20%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Eriogonum microthecum																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	2	1	-	-	-	-	-	-	-	3	-	-	-	60			3
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	9	-	-	-	-	-	-	-	-	9	-	-	-	600			9
	94	3	4	-	-	-	-	-	-	-	7	-	-	-	140			7
	99	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	22	-	-	2	-	-	-	-	-	24	-	-	-	480	11	8	24
	99	14	1	4	2	-	-	-	-	-	21	-	-	-	420	7	6	21
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	1	1	-	-	-	-	-	-	2	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	+ 3%
'94	13%	00%	00%	-13%
'99	07%	19%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	600	Dec:		0%
'94	620			0%
'99	540			7%

Gutierrezia sarothrae																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	20	-	-	-	-	-	-	-	-	20	-	-	-	400			20
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	9	-	-	-	-	-	-	-	-	9	-	-	-	600			9
	94	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
	99	8	-	-	-	-	-	-	-	-	8	-	-	-	160			8
M	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66	6	5	1
	94	82	-	-	1	-	-	-	-	-	83	-	-	-	1660	10	11	83
	99	22	30	-	-	-	-	-	-	-	52	-	-	-	1040	8	8	52
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	+63%
'94	00%	00%	01%	-34%
'99	50%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	666	Dec:		0%
'94	1820			1%
'99	1200			0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
S	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	87	4	-	-	-	-	-	-	-	-	2	-	2	-	266	4	14	4
	94	14	-	-	-	-	-	-	-	-	14	-	-	-	280	4	9	14
	99	3	-	-	1	-	-	-	-	-	5	-	-	-	100	5	13	5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	50%	+ 5%
'94	00%	00%	00%	-43%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	266	Dec:	-
	'94	280		-
	'99	160		-

Pinus edulis																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	1	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	80		-

Trend Study 13A-12-99

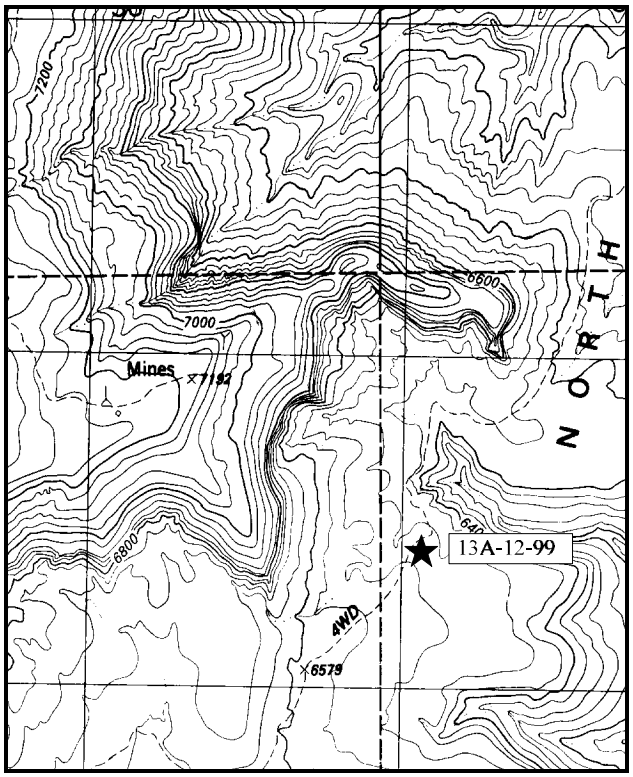
Study site name: Polar Below Rim . Range type: Chained, Seeded P-J .

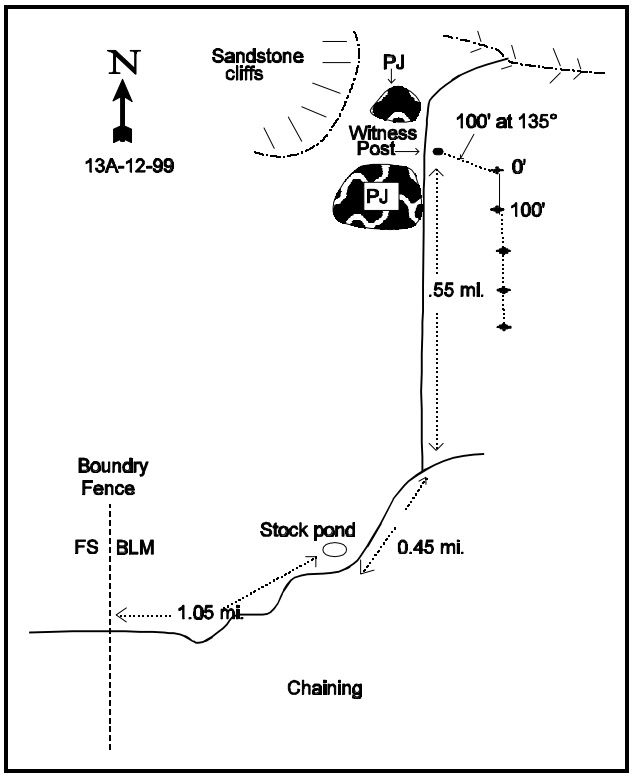
Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the intersection of La Sal Mountain Loop and Gateway roads, travel east towards Gateway, Colorado for 7.7 miles to the North Beaver Mesa turnoff. Turn left and go 4.2 miles to the Polar Mesa/Fisher Valley road. Continue straight through this fork, over a cattleguard and 0.85 miles to a stockpond and study 13A-12-87. Continue 0.45 miles to a fork by another stockpond. Turn right, go 0.35 miles to an intersection. Turn left and proceed 0.6 miles to a boundary fence. Continue on the road 1.05 miles, winding through the large chaining, to a stock pond. Cross the pond and continue 0.45 miles to a fork. Keep left on the main raod and continue 0.55 miles to a fence post on the right side of the road. The 0-foot baseline stake, tagged #7857, is 100 feet away at 135°.





Map Name: Dolores Point North Diagrammatic Sketch

Township 25S , Range 25E , Section SE l/4,1 UTM 4280296.225 N, 665003.451 E

DISCUSSION

Trend Study No. 13A-12 (33-12)

The Below Polar Mesa Rim range trend study samples a large chaining on lower Beaver Mesa. The 1,540 acre treatment of this pinyon-juniper covered mesa was two-way-chained and seeded in 1969. The site is on a bench that slopes gently south towards the rim of Beaver Canyon with an elevation of 6,500 feet. The site currently supports a dense population of Wyoming big sagebrush (10,900 plants/acre) with a fair abundance of crested wheatgrass and some increase of pinyon trees. This BLM land is grazed by cattle and horses from winter to spring. It is thought to be used almost equally by deer and elk in the winter. The pellet group transects done on site in 1999 estimate there to be 52 cow days use/acre (128 cdu/ha), 13 deer days use/acre (32 ddu/ha), and 94 elk days use/acre (232 edu/ha).

The soil is a sandy clay loam which has a neutral (6.7 pH) soil reaction and has no rock or gravel on the surface. The effective rooting depth is 15 inches. Percent organic matter is quite low (1.6 %) and amount of phosphorous in the soil could be limiting with only 6.5 ppm, where 10 ppm is thought to be minimal for normal plant development. The herbaceous species provide good protective cover from erosion by providing, on average, 58% of the total vegetative cover. There is little evidence of soil loss.

The key browse species on this chaining is Wyoming big sagebrush. It has consistently made up 31 to 32% of the total vegetative cover since 1994. Percent decadence has always been below 10% with the percent dead within the population being less than 1%. The percent young age class has varied greatly, however on average it has been 38% through all readings. Most of the population shows only light to moderate use. There are a few scattered fourwing saltbush and ephedra. Other woody plants on the site are increasers like broom snakeweed, pricklypear cactus, and pinyon pine. Their populations are currently low, providing less than 1% of the total plant cover.

Grasses are an important forage resource on this site and they also provide excellent soil stability (making up almost 50% of the total vegetative cover). The most common native, blue grama, provides on average almost 50% of the grass cover and provides excellent soil protection, although it produces little forage. The larger grasses such as crested wheatgrass, needle-and-thread, galleta, and sand dropseed provide more readily available forage. Crested wheatgrass has only a moderate quadrat frequency which is low for a seeded area and provides on average only about 18% of the grass cover. Forbs, although fairly diverse, are not as important in terms of forage production as they only contribute on average about 10% of the total vegetative cover.

Percent bare ground has stayed fairly consistent between 40 and 38% through the years. There is no rock-pavement cover. Percent litter has decreased somewhat as expected with the extended drought, but stabilized at about 31%. There are no large exposed patches of bare ground due to good herbaceous cover. Most of the litter cover is debris from the two-way chaining.

1994 TREND ASSESSMENT

Soil trend for this site has slightly improved with less bare soil and an excellent herbaceous cover. The browse trend is slightly improved with increased density, lower percent decadency, and good vigor for Wyoming big sagebrush. The herbaceous understory is good, even with the extended drought conditions. Trend is stable for the perennial herbs.

TREND ASSESSMENT
soil - slightly improved
browse - slightly improved
herbaceous understory - stable

1999 TREND ASSESSMENT

Soil trend for this site has shown little change with good herbaceous cover. The browse trend is stable with continued low percent decadency and good vigor for Wyoming big sagebrush. The herbaceous understory is good, however with the continued dry conditions, there is a slight decline in the sum of nested frequency values for the perennial species and even for the annual species. Trend is slightly down.

TREND ASSESSMENT
soil - stable
browse - stable
herbaceous understory - slightly down

HERBACEOUS TRENDS --
Herd unit 13A, Study no: 12

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
G	Agropyron cristatum	139	145	126	57	51	48	3.17	3.07
G	Bouteloua gracilis	$_{b}$212	$_{a}$177	$_{ab}$201	73	63	73	6.89	9.97
G	Bromus tectorum (a)	-	53	40	-	20	17	.32	.50
G	Hilaria jamesii	22	22	13	13	8	6	.09	.13
G	Poa secunda	104	112	92	41	43	37	.97	2.25
G	Sitanion hystrix	$_{b}$35	$_{a}$17	$_{a}$15	16	7	6	.08	.13
G	Sporobolus cryptandrus	-	6	4	-	2	2	.18	.18
G	Stipa comata	$_{b}$183	$_{b}$201	$_{a}$101	65	76	44	3.44	1.04
G	Vulpia octoflora (a)	-	$_{b}$168	$_{a}$80	-	63	27	.44	1.30
Total for Annual Grasses		0	221	120	0	83	44	0.75	1.80
Total for Perennial Grasses		695	680	552	265	250	216	14.84	16.78
Total for Grasses		695	901	672	265	333	260	15.60	18.59
F	Astagalus cicer	39	52	43	18	27	22	.24	.21
F	Astragalus convallarius	-	5	2	-	2	1	.01	.03
F	Calochortus nuttallii	$_{c}$46	$_{b}$4	$_{a}$-	26	3	-	.01	-
F	Castilleja spp.	$_{a}$-	$_{b}$25	$_{a}$-	-	11	-	.10	-
F	Draba reptans (a)	-	$_{b}$139	$_{a}$-	-	60	-	.30	-
F	Erigeron pumilus	$_{b}$67	$_{a}$38	$_{ab}$58	33	20	28	.22	.92
F	Gilia spp. (a)	-	$_{b}$85	$_{a}$-	-	41	-	.20	-
F	Lomatium spp.	3	-	-	1	-	-	-	-
F	Medicago sativa	6	4	2	3	2	2	.18	.21
F	Microsteris gracilis (a)	-	$_{b}$49	$_{a}$4	-	20	1	.10	.00

Type	Species	Nested Frequency '87	'94	'99	Quadrat Frequency '87	'94	'99	Average Cover % '94	'99
F	Oenothera albicaulis (a)	$_{b}$5	$_{a}$-	$_{a}$-	3	-	-	-	-
F	Phlox longifolia	$_{b}$76	$_{b}$71	$_{a}$22	31	32	9	.18	.09
F	Plantago patagonica (a)	-	96	73	-	41	28	.20	.53
F	Potentilla gracilis	$_{a}$-	$_{b}$38	$_{a}$-	-	13	-	.26	-
F	Sphaeralcea coccinea	135	131	110	55	53	47	1.12	1.60
F	Tragopogon dubius	1	-	-	1	-	-	-	-
F	Tragopogon porrifolius	$_{b}$9	$_{b}$9	$_{a}$-	4	3	-	.01	-
Total for Annual Forbs		5	369	77	3	162	29	0.81	0.53
Total for Perennial Forbs		382	377	237	172	166	109	2.37	3.07
Total for Forbs		387	746	314	175	328	138	3.18	3.61

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 13A, Study no: 12

Type	Species	Strip Frequency '94	'99	Average Cover % '94	'99
B	Artemisia tridentata wyomingensis	92	88	9.97	12.05
B	Atriplex canescens	1	2	1.00	.03
B	Eriogonum microthecum	7	4	.07	.03
B	Gutierrezia sarothrae	5	4	.15	.00
B	Opuntia spp.	20	20	.29	.05
B	Pinus edulis	0	4	1.27	5.05
B	Sclerocactus whipplei	0	8	.00	.03
Total for Browse		125	130	12.77	17.25

CANOPY COVER --
Herd unit 13A, Study no: 12

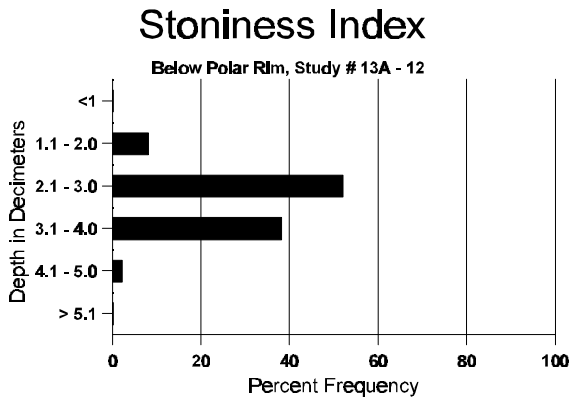
Species	Percent Cover '99
Pinus edulis	3

BASIC COVER --
Herd unit 13A, Study no: 12

Cover Type	Nested Frequency '94	Nested Frequency '99	Average Cover % '87	Average Cover % '94	Average Cover % '99
Vegetation	368	332	12.25	34.09	36.44
Rock	1	-	0	.00	0
Pavement	-	9	0	0	.01
Litter	391	343	42.25	30.93	31.25
Cryptogams	168	146	5.00	1.81	4.96
Bare Ground	352	321	40.50	38.21	38.89

SOIL ANALYSIS DATA --
Herd Unit 13A, Study # 12, Study Name: Below Polar Rim

Effective rooting depth (cm)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
15.1	58.2 (16.2)	6.7	58.9	19.8	21.3	1.6	6.5	60.8	0.3



PELLET GROUP DATA --
Herd unit 13A, Study no: 12

Type	Quadrat Frequency '94	Quadrat Frequency '99
Rabbit	30	22
Horse	-	2
Elk	39	37
Deer	8	18
Cattle	-	6

Pellet Transect Days Use/Acre (ha) '99
N/A
N/A
94 (232)
13 (32)
52 (128)

BROWSE CHARACTERISTICS --
Herd unit 13A, Study no: 12

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
S	87	8	-	-	-	-	-	-	-	-	7	1	-	-	533			8
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	4	6	9	-	-	-	-	-	-	19	-	-	-	380			19
Y	87	77	5	-	-	-	-	-	-	-	79	2	1	-	5466			82
	94	11	-	-	-	-	-	-	-	-	5	-	2	4	220			11
	99	40	158	22	-	-	-	-	-	-	220	-	-	-	4400			220
M	87	4	18	7	-	-	-	-	-	-	29	-	-	-	1933	20	31	29
	94	644	11	-	-	-	-	-	-	-	599	1	52	3	13100	15	21	655
	99	143	84	47	-	-	2	-	-	-	273	2	-	1	5520	18	31	276
D	87	3	1	1	-	-	-	-	-	-	5	-	-	-	333			5
	94	24	-	-	-	-	-	-	-	-	17	-	2	5	480			24
	99	34	12	3	-	-	-	-	-	-	45	-	-	4	980			49
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	100			5
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	120			6

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	21%	07%	.86%	+44%
'94	02%	00%	10%	-21%
'99	47%	14%	.91%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	7732	Dec:	4%
	'94	13800		3%
	'99	10900		9%

Atriplex canescens																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	2	-	-	-	-	-	-	-	2	-	-	-	40	23	27	2
	99	4	-	-	-	-	-	-	-	-	4	-	-	-	80	21	13	4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	40		-
	'99	80		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Eriogonum microthecum																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	18	-	-	-	-	-	-	-	-	18	-	-	-	360	4	10	18
	99	2	-	-	-	-	-	1	-	-	3	-	-	-	60	11	8	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	-67%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	360		-
	'99	120		-

Gutierrezia sarothrae																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	4	-	-	-	-	-	-	-	-	4	-	-	-	80	8	9	4
	99	4	-	-	-	-	-	-	-	-	4	-	-	-	80	8	12	4
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	+29%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	0%
	'94	100		20%
	'99	140		0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
S	87	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	87	6	-	-	-	-	-	-	-	-	6	-	-	-	400			6
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	9	-	-	-	-	-	-	-	-	9	-	-	-	180			9
M	87	11	-	-	-	-	-	-	-	-	8	1	2	-	733	3	13	11
	94	27	3	-	-	-	-	-	-	-	28	2	-	-	600	3	9	30
	99	16	-	-	-	-	-	-	-	-	16	-	-	-	320	4	9	16
D	87	2	-	-	-	-	-	-	-	-	-	-	2	-	133			2
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	3	-	-	-	-	-	-	-	-	-	-	-	3	60			3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	21%	-51%
'94	10%	00%	00%	-10%
'99	00%	00%	11%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	1266	Dec:		11%
'94	620			3%
'99	560			11%

Pinus edulis																		
S	87	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	3	-	-	-	-	-	-	1	-	4	-	-	-	80	-	-	4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:		-
'94	0			-
'99	100			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Sclerocactus whipplei																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	4	0
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60	1	2	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	200		-

*****THIS SITE WAS DROPPED*****

Trend Study 13A-13-99

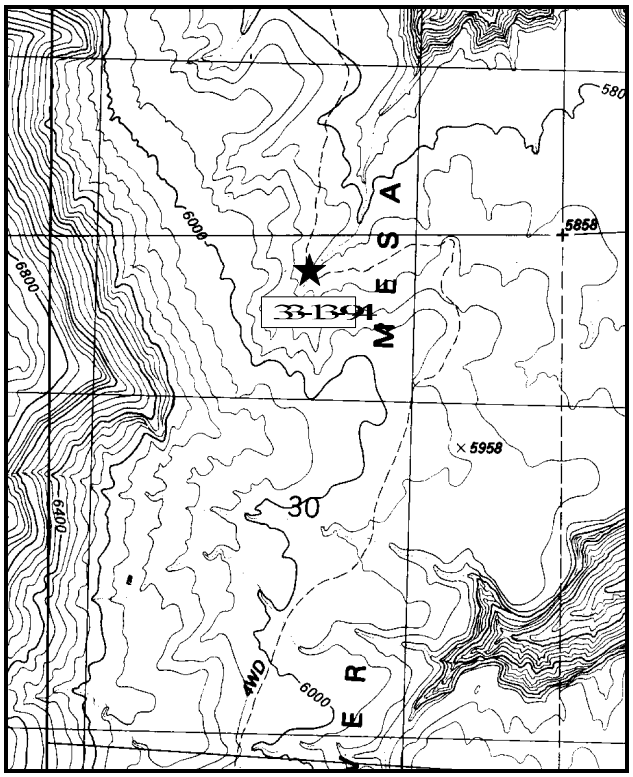
Study site name: Beaver Canyon . Range type: Big Sagebrush-Grass .

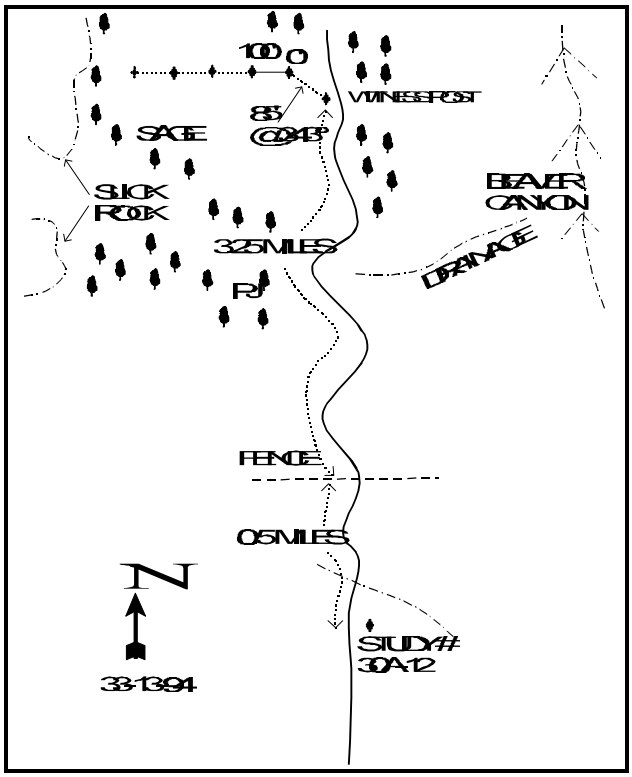
Compass bearing: frequency baseline 278 degrees.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From transect 13A-12-94, continue along the North Beaver Mesa Road for 0.5 miles to a gate. Continue 3.25 miles to the transect witness post located just off the left side of the road. The 0-foot baseline stake, a l-foot tall fence post tagged #7819, is 85 feet from the witness post on a bearing of 343°.





Map Name: Dolores Point North Diagrammatic Sketch

Township 24S , Range 26E , Section 30

DISCUSSION

Trend Study No. 13A-13 (33-13)

This site has been dropped, however the text is included in case there is some need for this summary of data collected in 1987 and 1994. The study sampled a sagebrush opening in the pinyon-juniper which is representative of the vegetation on the low, northern portion of Beaver Mesa. This area is used by deer and elk in severe winters. There is also some livestock use in the winter.

The study is on a gently east facing slope (5%) with an elevation of 6,100 feet. Soil on the site appears to be moderately deep, loose, and sandy. The soil surface is characterized by small mounds of soil and vegetation, with surrounding soil 3-4 inches lower due to soil loss. Small gullies are common. Patches of cryptogamic soil are effective in holding some of the soil in place. Erosion is especially severe in the surrounding mature pinyon-juniper woodlands which have very little herbaceous cover.

Similar to the rest of North Beaver Mesa, the key browse species is Wyoming big sagebrush. In 1994, it had a moderate stand density of 4,060 plants per acre with a cover value of approximately 10%. A majority of the plants were smaller than normal, but generally appear to be healthy mature plants. Thirty-eight percent of the sagebrush population were classified as decadent in 1987, however, in 1994 this decreased to 32%. Twenty-two percent of the population showed heavy use in the past, now only 11% show heavy use. Overall, use appears to be light during the recent winter, but past use appears to have been more heavy. Overall degree of hedging is moderate. Occasional fourwing saltbush plants are heavily hedged, exhibiting vigorous leader growth in 1987. Winterfat is even more uncommon. There are a few conifers in the opening. The commonly encountered increaser species included broom snakeweed and pricklypear cactus.

Grass cover is spotty with a low density. However, perennial species such as needle-and-thread, galleta, crested wheatgrass, blue grama, Sandberg bluegrass, and bottlebrush squirreltail were the perennial species most often encountered on this site. The annual grasses on the site (cheatgrass and sixweeks fescue) made up 21% of the total grass cover. These annuals appear mostly as randomly associated patches. Small desert forbs are fairly numerous, but provide very little forage as together they only contribute 2% of the cover.

The presence of soil-stabilizing cryptogams is reflected in their 5% cover value. Vegetative cover is fair at 31%, with 64% of this cover coming from herbaceous species. Litter cover is quite low at only 21%, although percent bare ground has decreased from 56% to 45%.

1994 TREND ASSESSMENT

The trend for soils is improving, but they are still only in fair condition. An improvement in percentage of herbaceous cover would greatly improve the soil trend. The slight decline in density of Wyoming big sagebrush is more reflective of the larger sample size used during the 1994 reading. Percent decadency of sagebrush has decreased and proportion classified as heavily hedged have also declined. However, those plants expressing poor vigor have increased. Overall, the browse trend is stable. The poor vigor of sagebrush will improve with an end to the extended drought especially hard felt in the southeastern part of the state. The herbaceous understory is stable as perennial grasses have slightly increased. Forbs have slightly decreased nested frequency values, but the forbs only make up about 10% of the total herbaceous cover.

TREND ASSESSMENT
soil - improving, but still only in fair condition because percent bare ground is still high at 45%
browse - stable
herbaceous understory - stable

Trend Study 13A-14-99

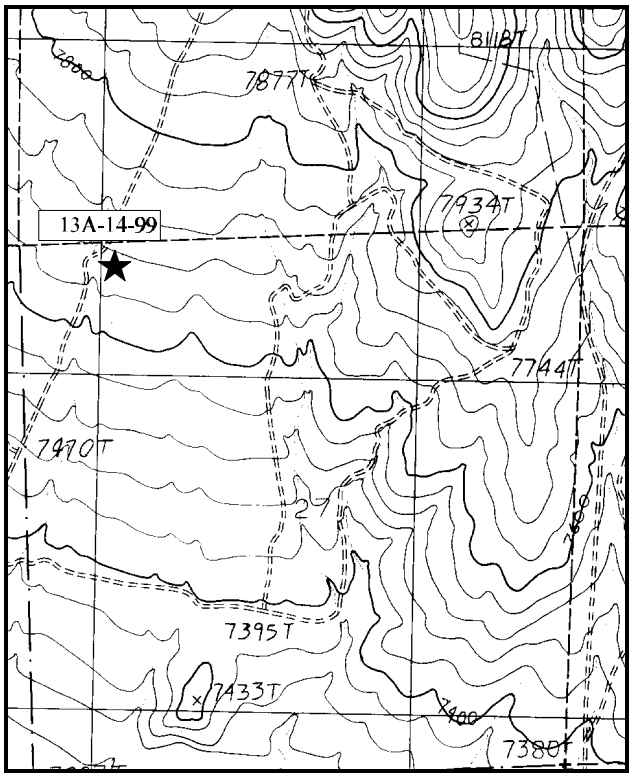
Study site name: Lower Lackey Fan . Range type: Sage-Grass (sprayed) .

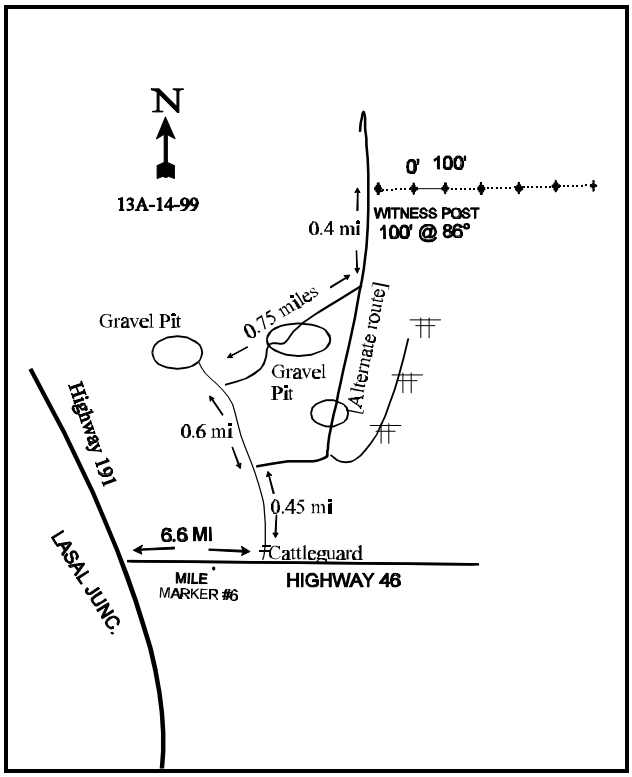
Compass bearing: frequency baseline 86°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5(95 ft).

LOCATION DESCRIPTION

From LaSal Junction travel east on Highway 46 to mile marker #6. Continue 0.60 miles from mile marker #6 and turn left (north) onto a dirt road. Go 0.45 miles to where the road forks and stay left on the main road. Continue 0.60 miles to where the road splits towards several gravel pits. Take the right fork and follow the road on the edge of the pit to where the road goes up and out of the pit. From here, travel 0.4 miles to a fork. Turn left and continue another 0.4 miles to a witness post. The 0-foot stake is found 100 feet away at a bearing of 86°M. Browse tag #200 marks the start of the baseline.
If there is no access through the gravel pit, an alternate exists. Refer to map below for this route





Map Name: LaSal West Diagrammatic Sketch

Township 28S , Range 24E , Section 27 UTM 4243960.231 N, 650438.169 E

DISCUSSION

Trend Study No. 13A-14 (33-14)

The Lower Lacky Fan site is a new study (1994) that is located on the lower southwest slopes of the LaSal Mountains at 7,700 feet in elevation. It is on a fairly flat ridge with scattered pinyon (6 trees/acre and average diameter of almost 4 inches) and juniper (6 trees/acre and average diameter of 5.75 inches) with a moderate density of Wyoming big sagebrush and fairly abundant crested wheatgrass. The sagebrush in the past has been sprayed and seeded to crested wheatgrass. This new area is thought to be particularly important to elk during the winter. The pellet group transects read on site in 1999 showed 12 cow days use/acre (30 cdu/ha), 20 deer days use/acre (49 ddu/ha), and 34 elk days use/acre (84 edu/ha).

The site has a moderately deep (effective rooting depth of almost 11 inches), reddish-brown, sandy clay loam soil with abundant rock in the profile and on the surface . The soil reaction is neutral (7.2 pH). Phosphorous could be a limiting factor on the site as it is 8.1 ppm were 10 ppm is considered minimal for normal plant development. The soil has a combined rock cover of 19% (rock 16% and pavement 3%) with a relatively low litter cover (37%). Percent bare ground (24%) is not as high as some other sagebrush/grass sites with a scattered population of pinyon and juniper. There is some evidence of soil movement, but this is mitigated by the lack of a steep slope.

The scattered pinyon and juniper provides some valuable cover for wintering animals during critical periods of winter. The key browse species is Wyoming big sagebrush with a moderate density of 3,880 plants/acre (1999). The population appears to be in a slightly downward trend with biotic potential going from 86% to 14%, percent young declining from 36% to 19%, and the percentage of mature plants increasing to 52%. Additionally, the proportion of the population that is classified as dead has gone from 5% to 14%, and the population has decreased by 21%. Strip frequency also shows this trend with a decrease from 86% in 1994 to 73% in 1999. A very low density of bitterbrush are scattered throughout the community. The increaser, broom snakeweed, in 1994 showed indications that it was increasing. Its density has increased greatly since then. Its estimated density has gone from 1,800 plants/acre to 20,060 plants/acre. Another way to interpret the changes is to look at how the proportion of the browse cover contributed by Wyoming big sagebrush and broom snakeweed has changed. Sagebrush made up 82% of the browse cover in 1994, now it only makes up 42%. For broom snakeweed, it initially contributed 6% of the browse cover, now it makes up 35% of the browse cover.

The herbaceous understory is primarily composed of grasses which make up, on average, 91% of the herbaceous cover. There are primarily only two grass species found on the site, crested wheatgrass and cheatgrass. Crested wheatgrass provided a little more than half as much cover as the Wyoming big sagebrush in 1994, now contributes more cover than sagebrush. Cheatgrass increased in nested frequency in 1999, but not significantly. Forbs were diverse in 1994, although nearly half were small, annual species. Only 5 species were sampled in 1999. All together, forbs provided only 2% of the plant cover in 1994, now they provide less than 1% cover.

1994 TREND ASSESSMENT

Because it is a new site there is no previous data to compare with. Inasmuch as the herbaceous species provide nearly 50% of the vegetative cover and percent bare ground is 29%, the soil on the site is considered stable, but only in fair condition. The apparent browse trend is considered up with the excellent biotic potential, good age class distribution and moderately low percentage of decadent plants. The herbaceous understory is stable, but the percentage of annual grass should be watched closely, for any increase would indicate a downward trend for the site.

TREND ASSESSMENT
soil - stable, but only fair condition
browse - up, but any increases for broom snakeweed should be watched closely
herbaceous understory - stable, annual grasses should be monitored closely

1999 TREND ASSESSMENT

The trend for soil is slightly improved, but still in poor condition. The decrease in bare soil is mostly because of increases in cheatgrass and snakeweed cover, both increasers. The browse trend has taken an unexpected turn downward as sagebrush has experienced decreases in cover, biotic potential, and the percentage of young in the population. The population density has also decreased by 21% as shown by the decrease in strip frequency. Also, increases in decadency and the percent of the population classified as dead point to a downward trend. There has also been an unusually large increase in the broom snakeweed population. The herbaceous understory is somewhat mixed. There have been increases for crested wheatgrass, but increases for cheatgrass as well. The forbs only made up 17% of the herbaceous cover in 1994, but have since been reduced to less than 1% of the herbaceous cover. Overall, trend is up for the herbaceous species, however the annual grass component should be watched closely as further increases would probably mean losses of other herbaceous species and a reduction in the number of sagebrush seedlings becoming established.

TREND ASSESSMENT
soil - slightly improved, but only fair condition
browse - down, but any further increases of broom snakeweed should be monitored closely
herbaceous understory - up, however annual grasses should be monitored closely

HERBACEOUS TRENDS --
Herd unit 13A, Study no: 14

Type	Species	Nested Frequency '94	'99	Quadrat Frequency '94	'99	Average Cover % '94	'99
G	Agropyron cristatum	225	*309	67	86	7.54	10.15
G	Bromus tectorum (a)	175	206	50	59	3.18	3.51
G	Vulpia octoflora (a)	-	*8	-	4	-	.02
Total for Annual Grasses		175	214	50	63	3.18	3.53
Total for Perennial Grasses		225	309	67	86	7.54	10.15
Total for Grasses		400	523	117	149	10.73	13.69
F	Astragalus convallarius	24	*3	13	2	.14	.01
F	Chenopodium spp. (a)	11	*-	5	-	.02	-
F	Comandra pallida	24	*-	12	-	.06	-
F	Collinsia parviflora (a)	26	*4	8	1	.09	.00
F	Cryptantha nevadensis	39	*-	12	-	.06	-
F	Cryptantha spp.	20	*-	9	-	.04	-
F	Dalea searlsiae	2	-	1	-	.00	-
F	Descurainia pinnata (a)	14	*-	5	-	.02	-
F	Draba nemorosa (a)	42	*-	16	-	.08	-
F	Erigeron pumilus	-	-	-	-	-	.00

Type	Species	Nested Frequency '94	'99	Quadrat Frequency '94	'99	Average Cover % '94	'99
F	Gayophytum ramosissimum (a)	22	*-	9	-	.04	-
F	Gilia spp. (a)	18	*-	8	-	.04	-
F	Heterotheca villosa	-	4	-	2	-	.03
F	Ipomopsis aggregata	2	1	1	1	.00	.00
F	Machaeranthera spp	1	-	1	-	.00	-
F	Microsteris gracilis (a)	60	6	20	3	.32	.01
F	Oxybaphus linearis	2	-	2	-	.01	-
F	Phlox longifolia	3	-	2	-	.01	-
F	Ranunculus testiculatus (a)	158	*-	44	-	.73	-
F	Salsola iberica (a)	3	-	2	-	.01	-
F	Schoencrambe linifolia	27	*-	10	-	.07	-
F	Sisymbrium altissimum (a)	-	-	-	-	.00	-
F	Sphaeralcea coccinea	5	*-	1	-	.38	-
F	Tragopogon dubius	5	-	3	-	.01	-
F	Trifolium spp.	3	-	1	-	.03	-
Total for Annual Forbs		354	10	117	4	1.37	0.01
Total for Perennial Forbs		157	8	68	5	0.84	0.05
Total for Forbs		511	18	185	9	2.22	0.07

* Indicates significant difference at % = 0.10

BROWSE TRENDS --
Herd unit 13A, Study no: 14

Type	Species	Strip Frequency '94	'99	Average Cover % '94	'99
B	Artemisia tridentata wyomingensis	86	73	12.07	9.84
B	Chrysothamnus depressus	0	1	-	-
B	Eriogonum microthecum	1	0	-	-
B	Gutierrezia sarothrae	37	73	.82	8.06
B	Juniperus osteosperma	0	1	-	-
B	Leptodactylon pungens	0	0	-	-
B	Pinus edulis	0	1	-	3.75
B	Purshia tridentata	1	4	.15	.15
B	Quercus gambelii	-	-	-	.15
B	Yucca spp.	6	7	1.60	1.31
Total for Browse		131	160	14.64	23.26

CANOPY COVER --
Herd unit 13A, Study no: 14

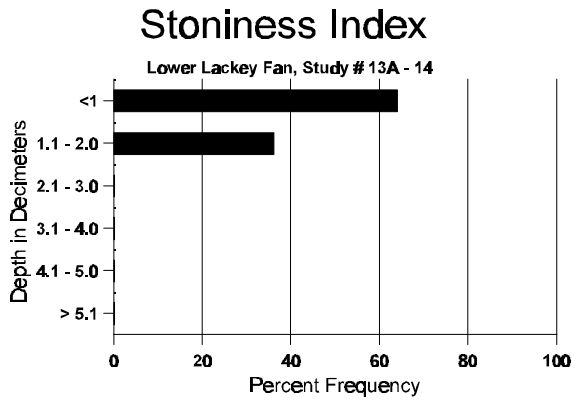
Species	Percent Cover '94	'99
Pinus edulis	-	5
Quercus gambelii	-	4

BASIC COVER --
Herd unit 13A, Study no: 14

Cover Type	Nested Frequency '94	'99	Average Cover % '94	'99
Vegetation	423	417	27.73	34.18
Rock	270	248	12.83	15.93
Pavement	242	220	1.11	3.06
Litter	479	451	31.20	36.69
Cryptogams	14	71	.06	1.40
Bare Ground	370	329	28.67	23.90

SOIL ANALYSIS DATA --
Herd Unit 13A, Study # 14, Study Name: Lower Lackey Fan

Effective rooting depth (cm)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
10.7	61.8 (12.5)	7.2	52.9	25.8	21.3	2.1	8.1	76.8	0.5



PELLET GROUP FREQUENCY --
Herd unit 13A, Study no: 14

Type	Quadrat Frequency '94	'99	Days Use per Acre (Hectare) '99
Rabbit	17	21	N/A
Elk	30	21	34
Deer	1	16	20
Cattle	-	8	12

BROWSE CHARACTERISTICS --
Herd unit 13A, Study no: 14

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
S	94	177	35	-	-	-	-	-	-	-	147	-	-	65	4240			212
	99	20	8	-	-	-	-	-	-	-	28	-	-	-	560			28
Y	94	84	4	-	-	-	-	-	-	-	88	-	-	-	1760			88
	99	27	8	-	1	-	-	-	-	-	35	-	1	-	720			36
M	94	90	12	4	1	-	-	-	-	-	99	1	7	-	2140	25	36	107
	99	30	54	17	-	-	-	-	-	-	99	2	-	-	2020	20	28	101
D	94	46	4	-	-	1	-	-	-	-	20	5	-	26	1020			51
	99	6	35	8	2	4	1	1	-	-	47	-	-	10	1140			57
X	94	-	-	-	-	-	-	-	-	-	-	-	-	-	260			13
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	700			35

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'94	09%	02%	13%	-21%
'99	52%	13%	06%	

Total Plants/Acre (excluding Dead & Seedlings)				
'94	4920	Dec:		21%
'99	3880			29%

Chrysothamnus depressus																		
M	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	3	6	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'94	0	Dec:	-
'99	20		-

Eriogonum microthecum																		
M	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40	9	11	2
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'94	40	Dec:	-
'99	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	94	86	-	-	-	-	-	-	-	-	86	-	-	-	1720			86
	99	44	-	-	-	-	-	-	-	-	44	-	-	-	880			44
Y	94	26	-	-	-	-	-	-	-	-	26	-	-	-	520			26
	99	281	5	-	-	-	-	-	-	-	286	-	-	-	5720			286
M	94	61	-	-	-	-	-	-	-	-	61	-	-	-	1220	10	10	61
	99	701	-	-	-	-	-	-	-	-	701	-	-	-	14020	11	11	701
D	94	3	-	-	-	-	-	-	-	-	2	-	-	1	60			3
	99	14	2	-	-	-	-	-	-	-	10	-	-	6	320			16
X	94	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	100			5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'94	00%	00%	01%	+91%
'99	.69%	00%	.59%	

Total Plants/Acre (excluding Dead & Seedlings)				
'94	1800	Dec:		3%
'99	20060			2%

Juniperus osteosperma

Y	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'94	0	Dec:	-
'99	20		-

Leptodactylon pungens

M	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	9	7	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'94	0	Dec:	-
'99	0		-

Pinus edulis

M	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	1	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'94	0	Dec:	-
'99	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Purshia tridentata																		
M	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20	13	27	1
	99	1	-	3	-	-	-	-	-	-	4	-	-	-	80	17	35	4
% Plants Showing			Moderate Use		Heavy Use			Poor Vigor								%Change		
	'94		00%		00%			00%								+75%		
	'99		00%		75%			00%										
Total Plants/Acre (excluding Dead & Seedlings)													'94		20	Dec:		-
													'99		80			-
Yucca spp.																		
Y	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	94	18	-	-	-	-	-	-	-	-	18	-	-	-	360	24	38	18
	99	20	-	-	-	-	-	-	-	-	20	-	-	-	400	18	29	20
X	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
% Plants Showing			Moderate Use		Heavy Use			Poor Vigor								%Change		
	'94		00%		00%			00%								+18%		
	'99		00%		00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)													'94		360	Dec:		-
													'99		440			-

Trend Study 13A-15-99

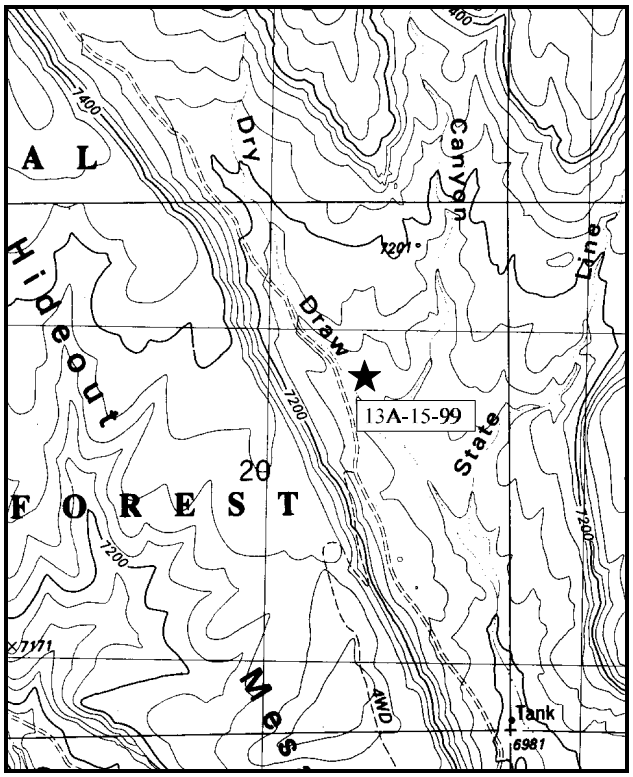
Study site name: Hideout Mesa . Range type: Sagebrush-Grass Burn .

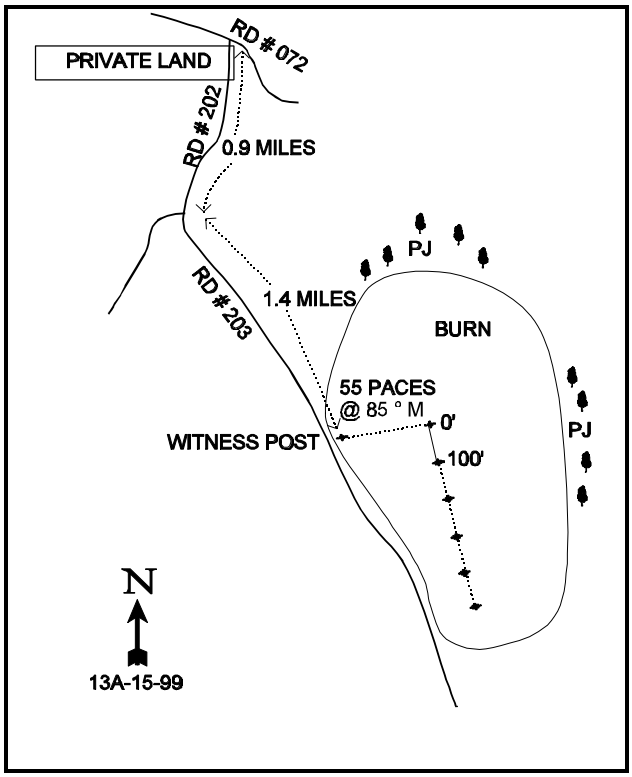
Compass bearing: frequency baseline 155°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From LaSal Junction take Highway 46 east to mile marker #16. From mile marker #16 travel east 0.10 miles and turn left (north). Proceed 1.2 miles to Forest Service Road #072 and turn right (fork heads toward Buckeye Reservoir). Continue 5.2 miles to a cattle guard. Continue 1.9 miles and turn right (south) on F. S. Road #202. Continue 0.90 miles and take on F. S. Road #203. Proceed 1.4 miles to a burn on the left side of the road. The baseline can be found by walking east several hundred feet out into the burn. The 0 foot stake is marked by browse tag #5.





Map Name: Ray Mesa Diagrammatic Sketch

Township 28S , Range 26E , Section 20 UTM 4246849.514 N, 668313.714 E

DISCUSSION

Trend Study No. 13A-15 (33-15)

Hideout Mesa is a site that was selected because of it's importance to an increasing elk population. It is located within the southeast lower benches of the LaSal Mountains, just west of the Colorado-Utah state line. It is in one of the bottom's of the many shallow canyons which are surrounded by several rugged flat-topped mesa's. This study is inside a shallow canyon bottom of sagebrush and grass, within a moderately large opening of thick pinyon-juniper woodland in association with scattered Ponderosa pine. The area had recently been burned. Pellet group transects that were read in 1999 show cow use at 50 cow days use/acre (124 cdu/ha), deer days use/acre at 11 (27 ddu/ha), and elk days use/acre at 36 (89 edu/ha). There are two well worn livestock trails that run through the site.

The site has an elevation of 7,100 feet with a southeast aspect and slope of about 3%. The shallow and narrow canyon bottom has a moderately shallow (effective rooting depth of only 10 inches) sandy clay loam soil with very little rock or pavement on the surface or within the profile. Soil pH is neutral (7.2) with good amounts of phosphorous, one of only a few sites with above 10 ppm of phosphorous. Past erosion problems are evident due to a large gully nearby that has been active historically. The site has a fairly good vegetative cover, with on average almost 60% of the cover coming from herbaceous species, which gives the best protection from high intensity summer storms. Percent bare ground is fairly high for this kind of site, but it has been about the same since 1994.

The most common browse species on this site in order of abundance are mountain big sagebrush, fringed sagebrush, low rabbitbrush, and broom snakeweed. There are a few scattered plants of serviceberry, fourwing saltbush, and rubber rabbitbrush. Most of the species appear to be stable to slightly increasing in density. The most important species of concern is mountain big sagebrush which appears to be increasing in numbers and on average provides 77% of the browse cover. The biotic potential (proportion of seedlings to the population) for this population was 196% in 1994, but only 3% in 1999. Percent young age class has gone from 27% up to 54%. Percent decadence has decreased from 17% down to 13%. Strip frequency has also indicated an increase in abundance. This all leads to a continuing increase in sagebrush numbers.

The herbaceous understory is diverse with 13 species of grasses and 35 species of forbs being identified in 1994 and 1999. Four species of grass (western wheatgrass, blue grama, prairie junegrass, and needle-and-thread grass) made up 88% of the grass cover in 1994. In 1999, these species only made up 72% of the grass cover. With little late summer precipitation, blue grama was not as productive as in 1994. However, cheatgrass has increased and more than compensated for this loss in cover. This is not a preferred phenomenon. However, this greatly increases the likelihood of another wildfire occurring in the area. Initially after the burn, annual grasses (cheatgrass and sixweeks fescue) made up less than one percent of the grass cover. Now they make up more than 18% of the grass cover. The herbaceous understory has many forb species, yet only one has a consistent cover value greater than one percent. Scarlet globemallow has a cover value on average of almost 2%.

1994 TREND ASSESSMENT

The soil trend, with the available data, would be stable with almost 60% of the vegetative cover coming from the herbaceous species. Litter cover is fairly good even with the recent fire. Percent bare ground is fairly high at 32%, but this is mitigated by the high amounts of litter and herbaceous cover. The browse trend is up with most of the key species showing characteristics of an increasing population, especially the mountain big sagebrush population. The herbaceous understory is stable to increasing.

TREND ASSESSMENT
soil - stable
browse - up
herbaceous understory - stable to up

1999 TREND ASSESSMENT

The soil trend appears to be stable with percent bare soil almost equal to what it was in 1994. Some litter cover was lost from 1994, but that was compensated for by increases in cryptogamic cover. On average about 60% of the vegetative cover comes from herbaceous species. The browse trend is up, especially for the key species (mountain big sagebrush) which continues to show characteristics of an increasing population. The herbaceous understory is stable to increasing even with the losses some forbs which is compensated for by the grasses.

TREND ASSESSMENT
soil - stable
browse - continued up, especially for sagebrush
herbaceous understory - stable to up

HERBACEOUS TRENDS --
Herd unit 13A, Study no: 15

Type	Species	Nested Frequency '94	'99	Quadrat Frequency '94	'99	Average Cover % '94	'99
G	Agropyron smithii	276	252	80	77	4.98	3.68
G	Bouteloua gracilis	58	50	19	18	1.16	.72
G	Bromus tectorum (a)	26	*127	8	38	.04	2.81
G	Carex spp.	1	5	1	3	.00	.02
G	Hilaria jamesii	6	4	3	1	.19	.03
G	Koeleria cristata	216	169	75	61	3.82	4.17
G	Oryzopsis hymenoides	3	9	1	3	.18	.09
G	Poa fendleriana	29	45	10	14	.12	.46
G	Poa pratensis	5	*-	3	-	.01	-
G	Poa secunda	-	*56	-	20	-	.59
G	Sitanion hystrix	54	*25	20	14	.95	.19
G	Sporobolus cryptandrus	-	*9	-	4	-	.04
G	Stipa comata	51	*86	23	32	1.24	2.47
G	Vulpia octoflora (a)	3	4	1	2	.00	.03
Total for Annual Grasses		29	131	9	40	0.04	2.85
Total for Perennial Grasses		699	710	235	247	12.69	12.50
Total for Grasses		728	841	244	287	12.74	15.35
F	Agoseris glauca	-	2	-	1	-	.00
F	Alyssum spp. (a)	4	*-	3	-	.01	-
F	Androsace septentrionalis (a)	-	*45	-	20	-	.10
F	Artemisia ludoviciana	29	23	10	8	.53	.57
F	Astragalus miser	9	3	3	1	.39	.03
F	Castilleja linariaefolia	6	*-	3	-	.06	-
F	Cirsium undulatum	4	1	2	1	.03	.00

Type	Species	Nested Frequency '94	'99	Quadrat Frequency '94	'99	Average Cover % '94	'99
F	Comandra pallida	94	*-	35	-	.69	-
F	Collinsia parviflora (a)	39	*1	15	1	.07	.00
F	Crepis acuminata	-	1	-	1	-	.03
F	Cryptantha spp.	6	*-	3	-	.02	-
F	Cymopterus spp.	4	-	1	-	.00	-
F	Descurainia pinnata (a)	3	*-	2	-	.01	-
F	Draba nemorosa (a)	75	*11	32	7	.16	.03
F	Erigeron spp.	8	*-	4	-	.02	-
F	Erigeron pumilus	42	*14	18	5	.09	.08
F	Eriogonum racemosum	11	6	6	5	.17	.05
F	Gayophytum ramosissimum (a)	4	-	1	-	.00	-
F	Gilia spp. (a)	148	*1	59	1	.32	.00
F	Grindelia squarrosa	41	*-	16	-	.15	-
F	Heterotheca villosa	12	11	5	4	.08	.36
F	Ipomopsis aggregata	10	*-	4	-	.02	-
F	Lappula occidentalis (a)	13	12	8	6	.04	.03
F	Linum lewisii	4	7	2	3	.01	.06
F	Lupinus spp.	4	1	2	1	.01	.03
F	Machaeranthera canescens	27	*6	13	2	.06	.01
F	Microsteris gracilis (a)	38	*114	14	42	.09	.36
F	Oenothera pallida	5	7	2	2	.03	.03
F	Orthocarpus spp. (a)	-	4	-	1	-	.00
F	Penstemon spp.	20	29	9	14	.07	1.27
F	Penstemon pachyphyllus	2	5	1	3	.00	.01
F	Penstemon thompsoniae	14	-	9	-	.70	-
F	Phlox longifolia	36	*19	17	7	.08	.03
F	Plantago patagonica (a)	77	*50	29	16	.32	.10
F	Polygonum douglasii (a)	28	38	10	19	.05	.09
F	Ranunculus testiculatus (a)	2	-	2	-	.01	-
F	Sphaeralcea coccinea	129	132	50	52	1.72	1.23
F	Trifolium spp.	11	*2	4	1	.02	.00
F	Zigadenus paniculatus	6	8	3	4	.01	.02
Total for Annual Forbs		431	276	175	113	1.09	0.74
Total for Perennial Forbs		534	277	222	115	5.02	3.86
Total for Forbs		965	553	397	228	6.12	4.60

* Indicates significant difference at % = 0.10

BROWSE TRENDS --
Herd unit 13A, Study no: 15

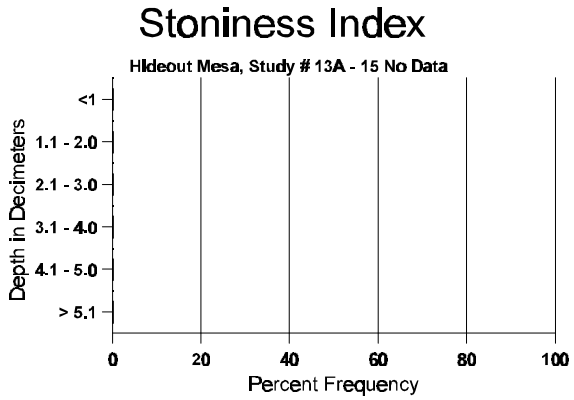
Type	Species	Strip Frequency '94	'99	Average Cover % '94	'99
B	Amelanchier utahensis	1	1	-	.03
B	Artemisia frigida	54	49	2.47	.89
B	Artemisia tridentata vaseyana	62	70	9.93	10.20
B	Atriplex canescens	4	7	.15	.02
B	Chrysothamnus depressus	0	1	-	.03
B	Chrysothamnus nauseosus	2	1	-	-
B	Chrysothamnus viscidiflorus viscidiflorus	24	27	.69	.96
B	Coryphantha vivipara arizonica	0	3	-	-
B	Eriogonum microthecum	3	5	.00	-
B	Gutierrezia sarothrae	14	15	.59	.25
B	Opuntia spp.	7	7	.00	.15
B	Pinus edulis	0	1	-	-
Total for Browse		171	187	13.87	12.53

BASIC COVER --
Herd unit 13A, Study no: 15

Cover Type	Nested Frequency '94	'99	Average Cover % '94	'99
Vegetation	438	429	29.71	35.97
Rock	17	28	.06	.89
Pavement	22	59	.04	.13
Litter	497	422	43.97	32.96
Cryptogams	79	251	1.32	9.93
Bare Ground	436	366	32.34	32.75

SOIL ANALYSIS DATA --
Herd Unit 13A, Study # 15, Study Name: Hideout Mesa

Effective rooting depth (cm)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
10.0	61.6 (11.2)	7.2	50.9	28.6	20.6	2.2	18.6	227.2	0.5



PELLET GROUP FREQUENCY --
Herd unit 13A, Study no: 15

Type	Quadrat Frequency '94	'99	Days Use per Acre (Hectare) '99
Rabbit	42	11	N/A
Elk	17	20	36
Deer	6	17	11
Cattle	-	5	50

BROWSE CHARACTERISTICS --
Herd unit 13A, Study no: 15

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier utahensis																		
M	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20	20	24	1
	99	-	-	1	-	-	-	-	-	-	1	-	-	-	20	30	28	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'94	00%	00%	00%	+ 0%
'99	00%	100%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'94	20		-
	'99	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia frigida																		
S	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	99	8	-	-	-	-	-	-	-	-	8	-	-	-	160			8
Y	94	24	-	-	-	-	-	-	-	-	24	-	-	-	480			24
	99	57	4	-	-	-	-	-	-	-	61	-	-	-	1220			61
M	94	149	-	-	5	-	-	-	-	-	154	-	-	-	3080	8	11	154
	99	171	14	2	-	-	-	-	-	-	187	-	-	-	3740	6	6	187
D	94	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
	99	2	1	-	1	-	-	-	-	-	1	-	-	3	80			4
X	94	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'94	00%	00%	00%	+27%
'99	08%	.79%	01%	

Total Plants/Acre (excluding Dead & Seedlings)				
'94	3660	Dec:		3%
'99	5040			2%

Artemisia tridentata vaseyana																		
S	94	278	-	-	172	-	-	-	-	-	450	-	-	-	9000			450
	99	8	-	-	2	-	-	-	-	-	10	-	-	-	200			10
Y	94	61	-	-	2	-	-	-	-	-	63	-	-	-	1260			63
	99	161	11	3	-	-	-	-	-	-	175	-	-	-	3500			175
M	94	119	6	-	2	-	-	-	-	-	94	-	33	-	2540	20	24	127
	99	76	30	3	-	-	-	-	-	-	109	-	-	-	2180	24	31	109
D	94	36	4	-	-	-	-	-	-	-	29	-	-	11	800			40
	99	28	11	2	-	-	-	-	-	-	35	-	2	4	820			41
X	94	-	-	-	-	-	-	-	-	-	-	-	-	-	2760			138
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	2320			116

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'94	04%	00%	19%	+29%
'99	16%	02%	02%	

Total Plants/Acre (excluding Dead & Seedlings)				
'94	4600	Dec:		17%
'99	6500			13%

Atriplex canescens																		
S	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
Y	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	1	-	-	-	-	-	-	-	2	-	-	-	40			2
M	94	3	-	-	1	-	-	-	-	-	3	1	-	-	80	21	16	4
	99	2	1	-	-	-	2	-	-	-	5	-	-	-	100	22	20	5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'94	00%	00%	00%	+43%
'99	29%	29%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'94	80	Dec:		-
'99	140			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus depressus																		
M	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60	4	12	3
% Plants Showing			Moderate Use		Heavy Use		Poor Vigor								%Change			
	'94		00%		00%		00%											
	'99		00%		00%		00%											
Total Plants/Acre (excluding Dead & Seedlings)													'94		0	Dec:		-
													'99		60			-
Chrysothamnus nauseosus																		
M	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40	29	32	2
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	27	32	1
% Plants Showing			Moderate Use		Heavy Use		Poor Vigor								%Change			
	'94		00%		00%		00%								-50%			
	'99		00%		00%		00%											
Total Plants/Acre (excluding Dead & Seedlings)													'94		40	Dec:		-
													'99		20			-
Chrysothamnus viscidiflorus viscidiflorus																		
S	94	9	-	-	-	-	-	-	-	-	9	-	-	-	180			9
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	94	7	-	-	-	-	-	-	-	-	5	-	-	2	140			7
	99	10	-	-	1	-	-	-	-	-	11	-	-	-	220			11
M	94	52	-	-	-	-	-	-	-	-	52	-	-	-	1040	7	15	52
	99	66	3	-	-	-	-	-	-	-	69	-	-	-	1380	6	10	69
X	94	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing			Moderate Use		Heavy Use		Poor Vigor								%Change			
	'94		00%		00%		03%								+26%			
	'99		04%		00%		00%											
Total Plants/Acre (excluding Dead & Seedlings)													'94		1180	Dec:		-
													'99		1600			-
Coryphantha vivipara arizonica																		
M	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60	3	4	3
% Plants Showing			Moderate Use		Heavy Use		Poor Vigor								%Change			
	'94		00%		00%		00%											
	'99		00%		00%		00%											
Total Plants/Acre (excluding Dead & Seedlings)													'94		0	Dec:		-
													'99		60			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Eriogonum microthecum																		
Y	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
M	94	6	-	-	-	-	-	-	-	-	6	-	-	-	120	9	11	6
	99	6	4	-	-	-	-	-	-	-	10	-	-	-	200	7	6	10
% Plants Showing		'94	Moderate Use 00%	Heavy Use 00%	Poor Vigor 00%											%Change +60%		
		'99	27%	00%	00%													
Total Plants/Acre (excluding Dead & Seedlings)													'94		120	Dec:		-
													'99		300			-
Gutierrezia sarothrae																		
S	94	5	-	-	1	-	-	-	-	-	6	-	-	-	120			6
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	94	-	-	-	2	-	-	-	-	-	2	-	-	-	40			2
	99	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
M	94	28	-	-	8	-	-	-	-	-	36	-	-	-	720	7	11	36
	99	29	-	-	-	-	-	-	-	-	29	-	-	-	580	6	6	29
D	94	4	-	-	-	-	-	-	-	-	2	-	-	2	80			4
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
X	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
% Plants Showing		'94	Moderate Use 00%	Heavy Use 00%	Poor Vigor 05%											%Change -14%		
		'99	00%	00%	00%													
Total Plants/Acre (excluding Dead & Seedlings)													'94		840	Dec:		10%
													'99		720			6%
Opuntia spp.																		
S	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	94	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	94	4	1	-	-	-	-	-	-	-	5	-	-	-	100	3	9	5
	99	6	-	-	-	-	-	-	-	-	6	-	-	-	120	4	10	6
% Plants Showing		'94	Moderate Use 13%	Heavy Use 00%	Poor Vigor 00%											%Change -13%		
		'99	00%	00%	00%													
Total Plants/Acre (excluding Dead & Seedlings)													'94		160	Dec:		-
													'99		140			-
Pinus edulis																		
M	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	1	-	-	-	-	-	1	-	-	-	20	-	-	1
% Plants Showing		'94	Moderate Use 00%	Heavy Use 00%	Poor Vigor 00%											%Change		
		'99	00%	00%	00%													
Total Plants/Acre (excluding Dead & Seedlings)													'94		0	Dec:		-
													'99		20			-

SUMMARY

WILDLIFE MANAGEMENT UNIT 13A (33, 30A) - LASAL MOUNTAINS

The higher elevation, transitional and elk winter range on the south side of the LaSals was sampled with two transects in relatively recent chainings at Two Mile (site #1), and Buck Hollow (site #3). These sites have good potential. Presently, the grass component is fairly vigorous and productive. The rest/rotation spring cattle grazing schedule should leave adequate grass standing for elk fall/winter use. Browse is diverse on the Two Mile site with a cover value of almost 25%, but browse is still limited on Buck Hollow where total browse cover is only 4% and 93% of the cover comes from pinyon. There is generally light to moderate use. Vegetative trends are stable to up. The chainings in the foothills around the southwest slope are in a later stage of succession, with the study at Amasas Back (site #5) showing an increasing dominance of pinyon-juniper. These two species have increased their cover values from 34% to 57% of the browse cover in 1999. Diversity and density of desirable browse are limited on this area. Vegetative trend is down and will probably continue until the area is retreated. Both Slaughter Flat (site #4) and Black Ridge (site #8) have very similar trends with declining populations of Wyoming big sagebrush and declining trends for herbaceous understory species.

Three studies were established on North Beaver Mesa. The low elevation site at Beaver Canyon (#13) receives light use in most years. This site was deleted in 1999. There is good winter range for deer and especially elk on the chaining at below Polar Rim (site #12). Soil trend appears stable, while the browse trend is stable and the herbaceous understory slightly down but still provides abundant grass forage. The North Beaver Mesa site (#11) receives moderately heavy use by both cattle and elk. Soil trend is stable. Browse trend is stable to slightly up.

In the two large valleys on the north side of the LaSals, one study was established in Castle Valley at Round Mountain (site #7) and one in Upper Fisher Valley (site #10). These sites provide critical deer winter range, and both have obviously continuing downward browse trends. The lower elevation site (#7) has a much lower density, and even with mostly light use, 34% of the population is dead. Grass cover for this site is only about 7%, however 96% of this cover is contributed by cheatgrass. The browse population has gone down to only 1,580 plants/acre. Trend is down for all measured parameters. The Upper Fisher Valley site (#10) is also experiencing downward trends for browse and herbaceous species. There is not much cheatgrass cover on this site, as it contributes only 4% of the grass cover at this time. The major concern for this site is that broom snakeweed has increased from 5,720 to 13,220 plants/acre. Soil trend is generally stable to slightly improving with large increases in cryptogamic cover (1% to 11%).

Another three studies were done on summer range. One was at East LaSal Pass (#2) which shows relatively little big game use. Soil and vegetative trends are stable. On Bald Mesa (#6), the black sagebrush appears stable, and it has a dense understory of grass and forb species. Abundant shrub and herbaceous forage is available. The state land around Taylor Flat (#9) is heavily used by domestic livestock. It appears that shrubs and the undesirable iris are increasing to the detriment of grasses on the study site. Currently, 76% of the herbaceous cover is contributed by weedy increaser species. Under current management, long-term range compositional trend is down. Overall soil trend is stable.

Two additional sites (Lower Lacky Fan #14 and Hideout Mesa #15) were added in 1994 after meetings with Interagency personnel. These sites were added to our study list because of the increases in the elk population. The Lower Lacky Fan site is located on the southwest slopes of the LaSal Mountains. This wintering area shows moderate use by elk and deer, and relatively high use by cows. The key browse species is Wyoming big sagebrush which is showing a significant downward trend. Another area of concern for this site is the phenomenal increase in the broom snakeweed population. Hideout Mesa is located within the southeast lower benches of the LaSal Mountains. Cattle use on the site is heavy, with moderate to light use respectively for elk and deer. The trend for the key browse (mountain big sagebrush) is upward.

Due to major land use by livestock in the LaSal unit, strategies necessary to maintain the critical big game habitat are necessary. Monitoring range trends and grazing practices are especially important on those areas which show increasing livestock, deer and elk use trends. The Division must continue to work with land management agencies, especially the state, to help maintain and improve critically key areas. Cooperative habitat improvement projects have been successful in the past. Proposed roller-chopper treatments and seedings should be jointly funded to help mitigate costs.

Site	Category	1994	1999
13A-1 Two Mile chaining	soil	-	+
	browse	0/-	-
	herbaceous understory	-	+
13A-2 East Lasal Pass	soil	0	0
	browse	0	0
	herbaceous understory	0	0
13A-3 Buck Hollow	soil	0	+
	browse	0	0
	herbaceous understory	0	0
13A-4 Slaughter Flat	soil	0	-
	browse	-	-
	herbaceous understory	0	-
13A-5 Amasas Back	soil	0/+	0
	browse	0/+	-
	herbaceous understory	-	-
13A-6 Bald Mesa	soil	0	0
	browse	0	0
	herbaceous understory	-	-
13A-7 Round Mountain	soil	-	-
	browse	-	-
	herbaceous understory	-	-
13A-8 Black Ridge	soil	0	-
	browse	-	-
	herbaceous understory	0	-

Site	Category	1994	1999
13A-9 Taylor Flat	soil	0	+
	browse	0	0
	herbaceous understory	0	0/+
13A-10 Upper Fisher Valley	soil	0/+	+
	browse	+	-
	herbaceous understory	0/+	-
13A-11 North Beaver Mesa	soil	+	0
	browse	0/+	0/+
	herbaceous understory	0	0
13A-12 Below Polar Rim	soil	+	0
	browse	+	0
	herbaceous understory	0	-
13A-13 Beaver Canyon	soil	+	Site Dropped
	browse	0	
	herbaceous understory	0	
13A-14 Lower Lackey Fan	soil	0	+
	browse	+	-
	herbaceous understory	0	+
13A-15 Hideout Mesa	soil	0	0
	browse	+	+
	herbaceous understory	0/+	0/+

(0) = stable, (+) = up, (-) = down, (0/+) = stable to up, (0/-) = stable to down